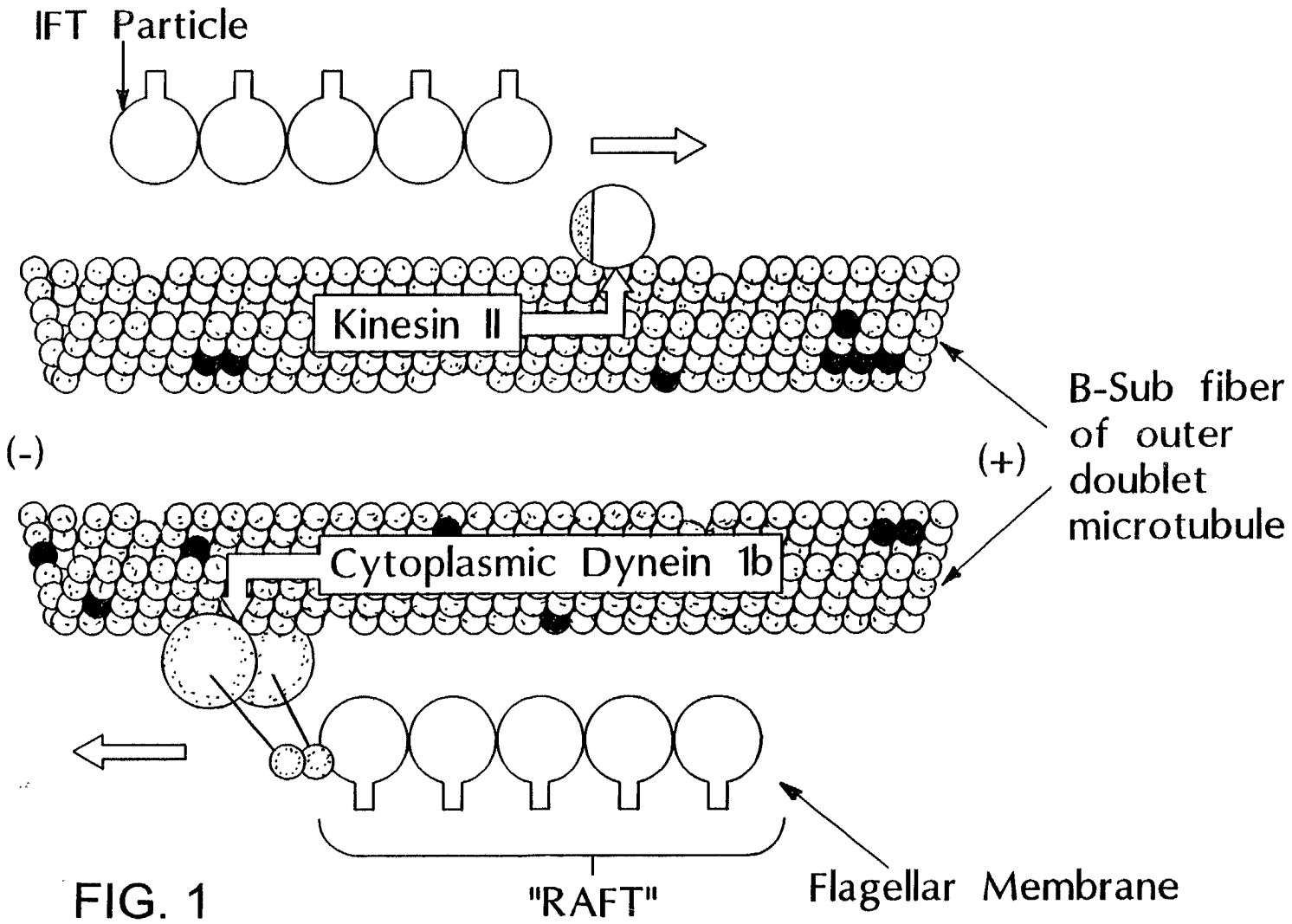
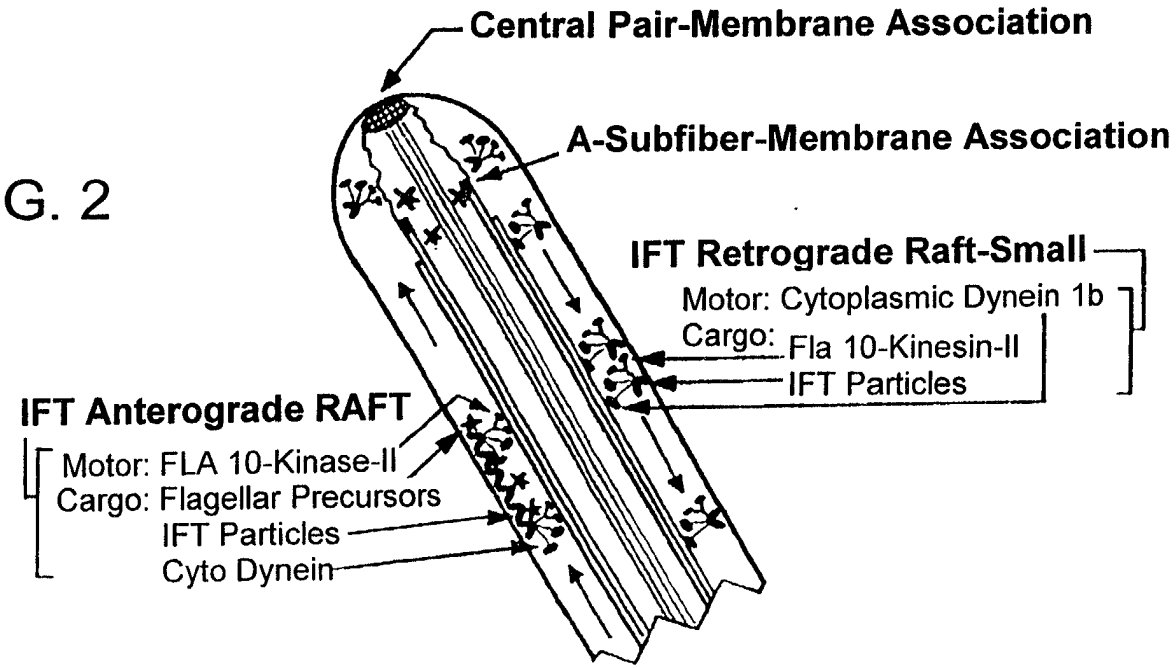

IFT Particle
Kinesin II
B-Sub fiber of outer doublet microtubule
(-)
(+)
Cytoplasmic Dynein 1b
"RAFT"
Flagellar Membrane

FIG. 1

FIG. 2



= IFT particle
= Heterotrimeric Kinesin II
= Cytoplamic Dynein 1b

Out / In = Pre-assembled axonemal proteins (radial spokes, dynein arms) Synthesized on free polysomes

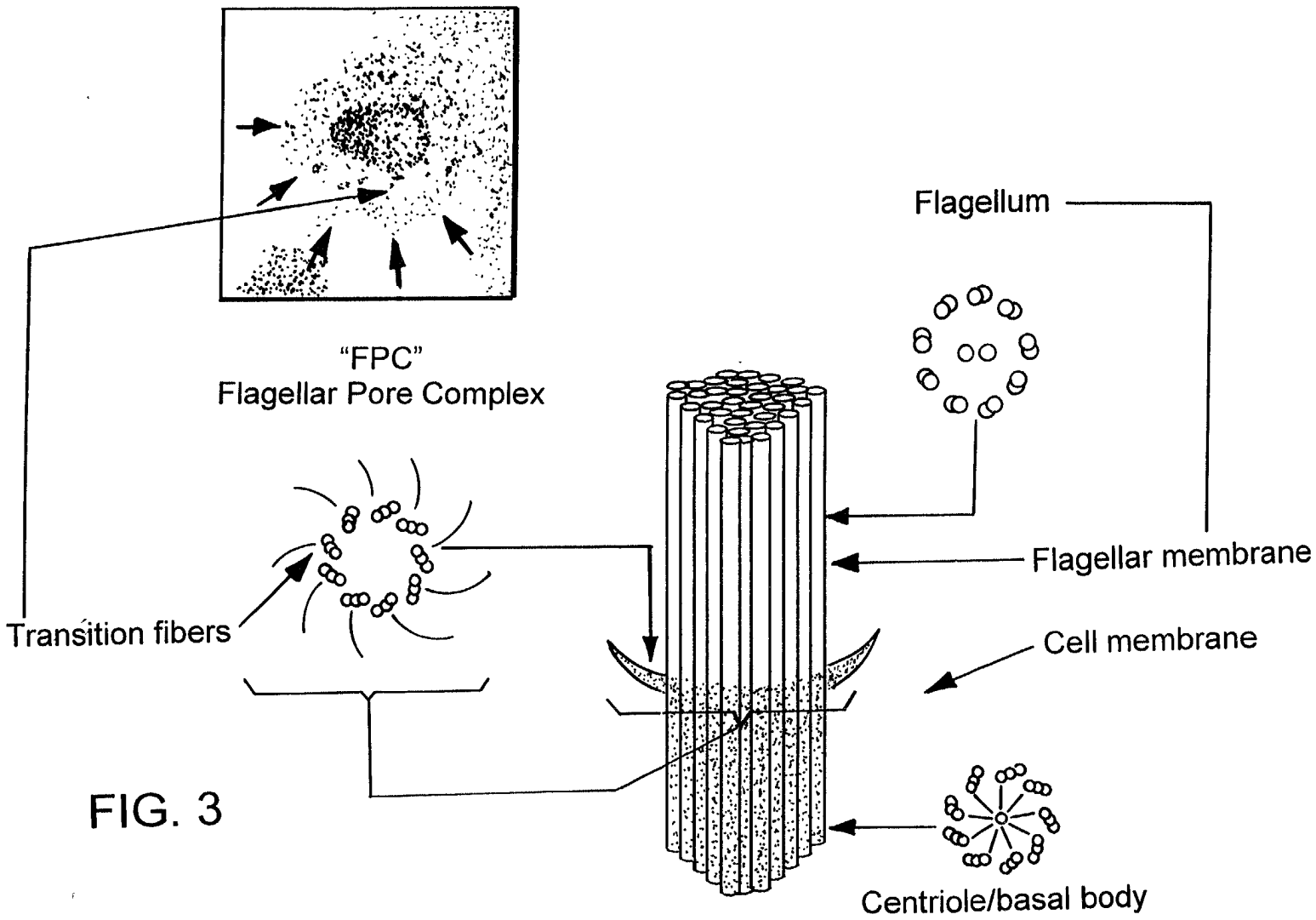

"FPC"
Flagellar Pore Complex
Flagellum
Flagellar membrane
Cell membrane
Transition fibers
Centriole/basal body

FIG. 3

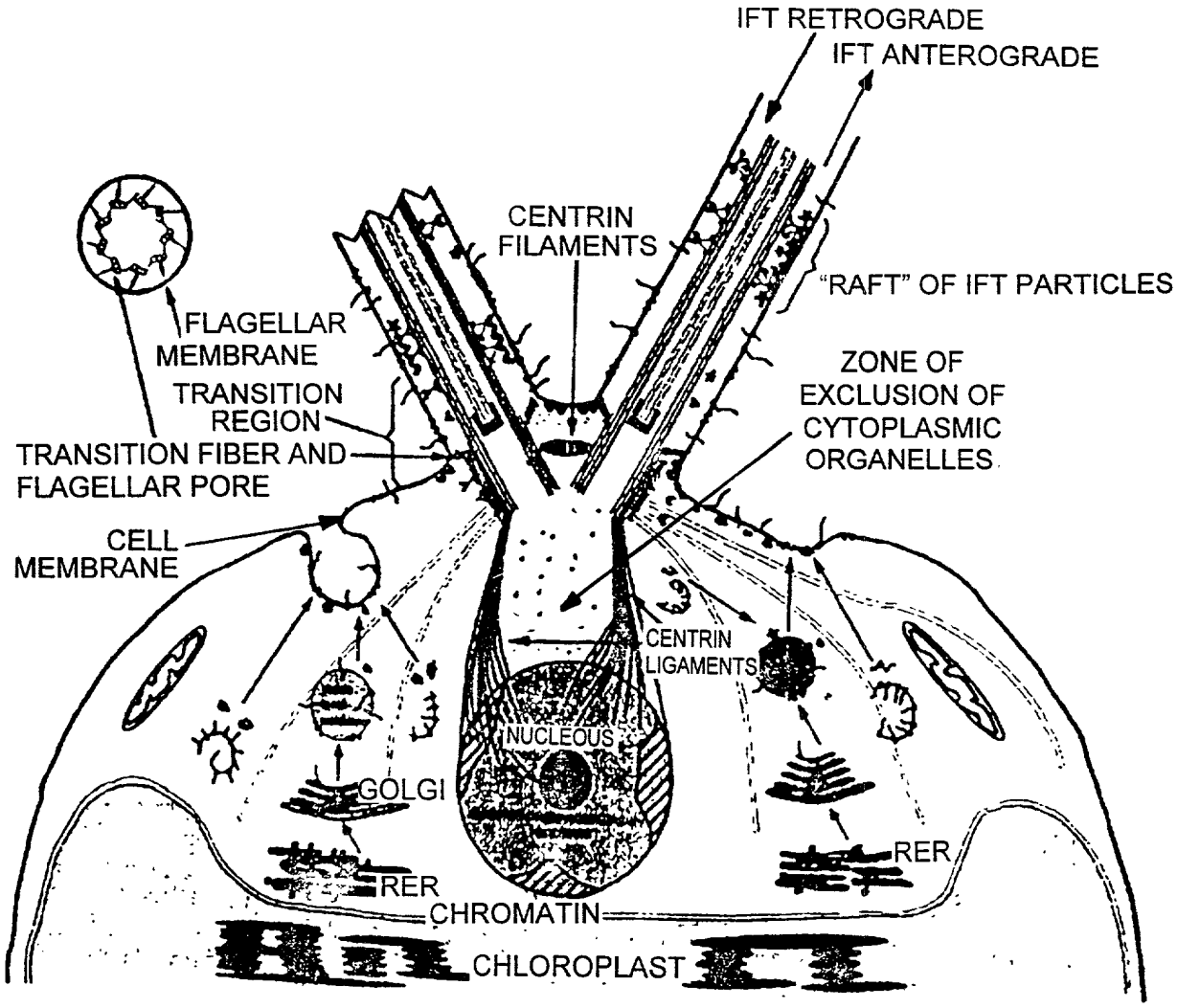

IFT RETROGRADE
IFT ANTEROGRADE
CENTRIN FILAMENTS
"RAFT" OF IFT PARTICLES
FLAGELLAR MEMBRANE
TRANSITION REGION
TRANSITION FIBER AND FLAGELLAR PORE
ZONE OF EXCLUSION OF CYTOPLASMIC ORGANELLES
CELL MEMBRANE
CENTRIN LIGAMENTS
NUCLEOUS
GOLGI
RER
RER
CHROMATIN
CHLOROPLAST
= IFT particle
= Heterotrimeric Kinesin II
= Cytoplamic Dynein 1b
= Free Polysomes
= Microtubules
Out
In
= Integral membrane proteins (Channels, etc.)(ER → Golgi)
Out
In
= Pre-assembled axonemal proteins (radial spokes, dynein arms) Synthesized on free polysomes
Out
In
= Peripheral membrane (protein (ER → Golgi)

FIG. 4

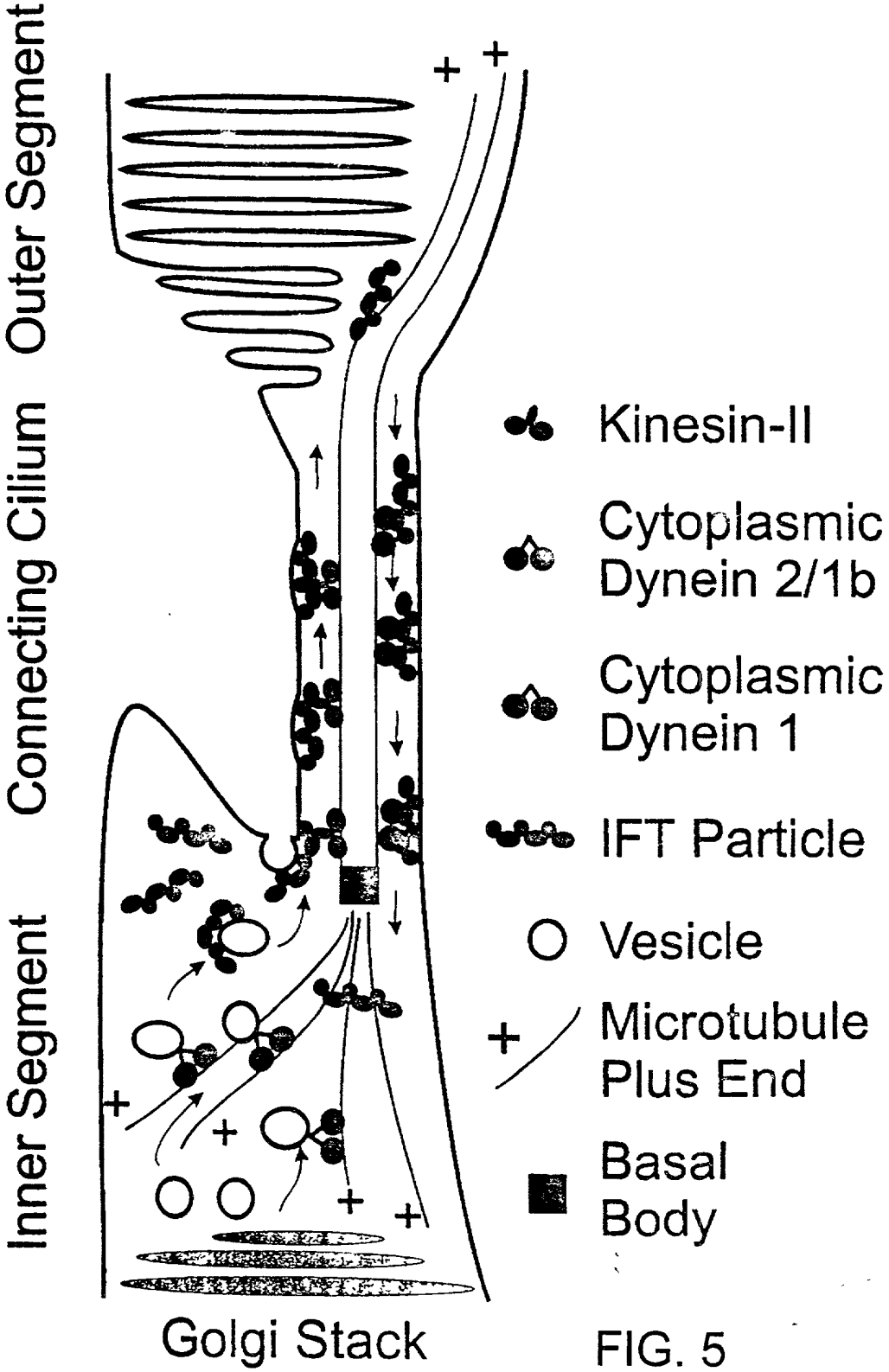

Outer Segment
Connecting Cilium
Inner Segment
Golgi Stack
Kinesin-II
Cytoplasmic Dynein 2/1b
Cytoplasmic Dynein 1
IFT Particle
Vesicle
Microtubule Plus End
Basal Body

FIG. 5

IFT20

Chlamydomonas

>Cr_IFT20 predicted peptide
MDAVDRGVYFDEDFHVRILDVDKYNASKSLQDNTNVFINNIQNMQGLVDKYVSAIDQQVERLEA
EKLKAIGLRNRVAALSEERKRKQKEQERMLAEKQEELERLQMEEQSLIKVKGEQELMIQKLSDSS
SGAAYV (SEQ ID NO: 2)

FIG. 6A

>Cr_IFT20 cDNA
CACCGCTGCCGCTGAACAGAAAGTCTGCGCAGACTCGTCTTCTTGCCAAGTTCTTGCCAAAAC
CAGCAGGCCTAGAGGTTGCCTTAACCTAAATATACAAAACACAGAGCATCATGGACGCGGTA
GATAGAGGAGTCTACTTTGACGAGGACTTTCATGTCCGCATTCTTGATGTTGACAAGTACAAT
GCTTCAAAGTCGCTCCAGGACAACACAAATGTGTTCATTAACAACATCCAAAATATGCAAGGC
CTCGTGGACAAGTACGTGTCCGCCATCGACCAGCAGGTCGAGCGGCTAGAAGCTGAAAAGCT
GAAGGCCATTGGCCTGCGGAACCGGGTGGCTGCGCTGAGCGAGGAGCGGAAACGTAAACAA
AAGGAGCAGGAGCGCATGCTAGCGGAGAAGCAGGAGGAGCTTGAGAGGCTCCAAATGGAGG
AGCAGTCGCTGATCAAGGTGAAGGGCGAGCAGGAGCTCATGATTCAGAAGCTGTCGGACAGC
AGCAGCGGGGCGGCATACGTGTAAACGGTGTTCGGACGTCATGCGTGCAAAGGTAGTTTGCT
CTGTGAGGGTTGGCTGAGGCGGCGGAGGCTGCTATTGAGGCTGCAGCATGCGGTCTGGTGGC
AGATGTACATAACGGTATGGGGTGTTGGCGACAGAACGAAACGGCGAGGGTGCGCAAATGTC
GTGCAGAAGCGACGCTACAGCATCCATGGTACGTAGAGGCTTACTGGGTGTCAGTGCGTCGTC
CGCCACTGGGGACACACTTGCAGCGAGGAGCGCCATTGTTTGGCCCACGGATTGCGTCAAGG
ACTTGAACGGCGCCAGTGAAGGCGGGGAATGGAATGTAAACAAACGACTCGAAAAAAAAAAA
AAAAAAAA (SEQ ID NO: 1)

FIG. 6B

Human

>Hs_IFT20-1 chr17 gb|AC002094.1|AC002094 [expressed]
MAKDILGEAGLHFDELNKLRVLDPEVTQQTIELKEECKDFVDKIGQFQKIVGGLIELVDQ
LAKEAENEKMKAIGARNLLKSIAKQREAQQQQLQALIAEKKMQLERYRVEYEALCKVEAE
QNEFIDQFIFQK (SEQ ID NO: 23)

FIG. 6C

> Hs_IFT20-2 EST gb|AA584846.1|AA584846
QDSLGEAGLCFDELSKVRDPEVT*QTRDPKEDCMDFVGKISPFQKEIVGGLIEPVDQLAKAAENEK
RKVVGAWNLLQFMAKHREAQQQQLLAQTAEEKMWLKRWWIEYE (SEQ ID NO: 24)

FIG. 6D

>Hs_IFT20-3 chr14 emb|AL121808.2|CNS01DSJ Human chromosome 14
MVKDILAEEGLHFDELNKLWVLDSEVTQQTTELKEECKNFADKTGQFQKTVGGLIELVDK
LAKKA*NAKMRAMVLR (SEQ ID NO: 25)

FIG. 6E

IFT27

Chlamydomonas

>Cr_IFT27 predicted peptide
MVKKEVKPIDITATLRCKVAVVGEATVGKSALISMFTSKGSKFLKDYAMTSG
VEVVVAPVTIPDTTVSVELFLLDTAGSDLYKEQISQYWNGVYYAILVFDVSSMESFESCK
AWFELLKSARPDRERPLRAVLVANKTDLPPQRHQVRLDMAQDWATTNTLDFFDVSANPPG
KDADAPFLSIATTFYRNYEDKVAAFQDACRNY (SEQ ID NO: 4)

FIG. 7A

>Cr_IFT27 cDNA sequence
ATGGTGAAGAAAGAAGTGAAGCCCATCGATATCACCGCAACGCTAAGATGCAAAGTAGCAGT
AGTCGGCGAAGCGACTGTCGGCAAGAGCGCGCTCATCTCTATGTTCACGAGTAAAGGCAGCA
AGTTTCTAAAGGACTATGCGATGACGAGTGGGGTGGAGGTGGTGGTAGCCCCGGTGACCATT
CCGGACACGACGGTCTCGGTGGAGCTCTTTCTGCTGGACACGGCGGGGAGCGACCTGTACAA
GGAGCAGATATCGCAGTACTGGAACGGCGTATACTACGCCATTCTCGTGTTCGATGTGAGCTC
TATGGAGTCCTTCGAGTCGTGCAAGGCGTGGTTTGAGCTGCTCAAATCGGCGCGTCCCGACCG
CGAGCGGCCGCTGCGCGCCGTGCTGGTGGCGAACAAGACGGACCTTCCGCCGCAGCGGCACC
AGGTGCGGCTGGACATGGCGCAGGACTGGGCCACCACCAACACCCTCGACTTCTTCGACGTGT
CCGCGAACCCGCCCGGCAAGGACGCGGATGCGCCGTTCCTGTCCATCGCCACCACCTTCTACC
GCAACTACGAGGACAAGGTGGCGGCCTTCCAGGACGCTTGCCGCAACTACTGA

(SEQ ID NO: 3)

FIG. 7B

Human

>Hs_IFT27 gi|12653581|gb|AAH00566.1|AAH00566 putative GTP-binding protein
MVKLAAKCILAGDPAVGKTALAQIFRSDGAHFQKSYTLTTGMDLVVKTVPVPDTGDSVELFIFDS
AGKELFSEMLDKLWESPNVLCLVYDVTNEESFNNCSKWLEKARSQAPGISLPGVLVGNKTDLAG
RRAVDSAEARAWALGQGLECFETSVKEMENFEAPFHCLAKQFHQLYREKVEVFRALA

(SEQ ID NO: 26)

FIG. 7C

IFT46

Chlamydomonas

>Cr_IFT46 predicted peptide sequence
MDDSMDYPDRDGDDLDQFQGTARSQVVQNQPHDEEVNLSESESFAGADE
PPAAPRDASLIESHDMDEGPAAPARTLSPTGYEAGKHAPGGIANSDEAPPGAYNAQEYKH
LNVGEDVRELFSYIGRYKPQTVELDTRIKPFIPDYIPAVGGIDEFIKVPRPDTKPDYLGL
KVLDEPAAKQSDPTVLTLQLRQLSKEAPGAKADMVGRLEHTDENKAKKIQQWIASINDIH
KAKPAATVNYSKRMPEIEALMQEWPPEVETFLKTMHMPSGDVELDIKTYARLVCTLLDIP
VYDDPVESLHVLFTLYLEFKNNPIFRQHMEMENKLDGMSGGGGGMMGGGADVLGL

(SEQ ID NO: 6)

FIG. 8A

>Cr_IFT46 cDNA sequence
ATGGATGACTCTATGGACTACCCTGACCGCGACGGGGACGACCTGGACCAGTTCCAGGGCAC
CGCGCGCTCGCAGGTCGTGCAGAACCAGCCGCACGACGAGGAGGTGAACCTGAGTGAGTCGG
AGAGCTTCGCGGGAGCGGATGAGCCTCCAGCTGCGCCTAGAGATGCGTCGCTCATAGAGTCA
CACGACATGGACGAGGGGCCAGCTGCTCCAGCGCGGACACTCTCACCAACGGGCTATGAGGC
TGGAAAGCACGCACCTGGCGGCATCGCCAACTCGGACGAGGCACCGCCGGGTGCTTACAACG
CACAGGAGTACAAGCACCTGAACGTGGGCGAGGACGTGCGCGAGCTGTTCTCCTACATCGGC
CGCTACAAGCCGCAGACGGTGGAGCTGGACACGCGCATCAAGCCCTTCATCCCTGACTACATC
CCCGCGGTGGGCGGCATCGACGAGTTCATCAAGGTGCCGCGACCCGACACCAAGCCCGACTA
CCTGGGGCTCAAGGTTCTGGACGAGCCGGCCGCCAAGCAGTCGGACCCCACGGTGCTGACGC
TGCAGCTGCGGCAGCTGTCCAAGGAGGCGCCGGGCGCCAAGGCCGACATGGTGGGGCGGCTG
GAGCACACCGACGAGAACAAGGCCAAGAAGATCCAGCAGTGGATCGCCTCCATCAACGACAT
CCACAAGGCCAAGCCGGCCGCCACCGTCAACTACAGCAAGCGCATGCCAGAGATCGAGGCGC
TGATGCAGGAGTGGCCGCCGGAGGTGGAGACCTTCCTCAAGACCATGCACATGCCGTCCGGC
GATGTGGAGCTGGACATCAAGACCTACGCCCGGCTGGTGTGCACGCTGCTGGACATTCCCGTG
TACGACGACCCCGTGGAGAGCCTGCACGTGCTGTTCACACTGTACCTGGAGTTCAAGAACAAC
CCCATCTTCAGGCAGCACATGGAGATGGAGAACAAGCTGGACGGCATGTCGGGCGGCGGCGG
CGGCATGATGGGCGGCGGCGCGGATGTGCTGGGCTTGTGA (SEQ ID NO: 5)

FIG. 8B

Human

>Hs_IFT46 gi|8926685|emb|CAB96537.1| hypothetical protein [Homo sapiens]
MADNSSDECEEENNKEKKKTSQLTPQRGFSENEDDDDDDDSSETDSDSDDDDEEHGAPLEGAY
DPADYEHLPVSAEIKELFQYISRYTPQLIDLDHKLKPFIPDFIPAVGDIDAFLKVPRPDGKPDNLGLL
VLDEPSTKQSDPTVLSLWLTENSKQHNITQHMKVKSLEDAEKNPKAIDTWIESISELHRSKPPATV
HYTRPMPDIDTLMQEWSPEFEELLGKVSLPTAEIDCSLAEYIDMICAILDIPVYKSRIQSLHLLFSLYS
EFKNSQHFKALAEGKKAFTPSSNSTSQAGDMETLTFS (SEQ ID NO: 27)

FIG. 8C

IFT52

Chlamydomonas

>Cr_IFT52 predicted peptide sequence
MEEPGAEEVRILFSTAKGESHTHKAGFKQLFRRLRSTYRPDKVDKDDFTLDTLRSAHILVLGGPKE
KFTAPEVDMLKKFVKNGGSILILMSEGGEEKAGTNINYFLEQFGMSVNNDAVVRTTHYKYLHPKE
VLISDGILNRAVITGAGKSLNSNDDDEFRVSRGPQAFDGTGLEYVFPFGATLSVQKPAVPVLSSGKI
AYPMNRPVGAVWAQPGYGRIAVLGSCAMFDDKWLDKEENSKIMDFFFKFLEPHSKIQLNDIDAEE
PDVSDLKLLPDTASLADKLKGCLQEIDDVPRDWTSLFDDSLFKFDTGLIPEAVSLYEKLGVKKGQL
NLIPPSFETPLPPLQPAVFPPTIREPPPPALELFDLDESFASETNRLASLTNKCHGEEDLEYYIMEAGH
ILGLKLQENANAKHVLSEVFRRIAQYKMGSLGLGQTLDSMGQTLPAANQFGDQFEL

FIG. 9A (SEQ ID NO: 8)

>*Chlamydomonas* cDNA sequence

CTAATGGCATGCAGTAAGGCACTGGTATAGAAACCGTTCCCACCGCCGCGCCCAGCCCCGCGT
CCTGTGAGCTGAGAGCTACTTAACAGCCATGGAGGAGCCGGGCGCGGAGGAGGTTCGGATTC
TCTTCAGCACAGCGAAGGGGGAATCCCATACGCACAAGGCAGGCTTCAAGCAGCTATTTCGA
CGATTGCGTTCAACTTATCGTCCAGACAAAGTAGATAAGGATGACTTCACGCTGGACACGCTG
CGGTCAGCGCACATCCTTGTGCTCGGTGGCCCGAAGGAGAAGTTCACCGCGCCTGAGGTGGA
CATGCTCAAAAAGTTCGTGAAGAATGGTGGCTCCATCCTCATTCTAATGTCGGAGGGCGGCGA
GGAGAAGGCGGGCACTAACATCAACTACTTCCTCGAGCAGTTTGGCATGTCGGTGAACAACG
ACGCCGTGGTCCGCACCACGCACTACAAGTACCTGCACCCCAAGGAGGTGCTCATCTCGGACG
GCATCCTCAACCGGGCGGTGATCACGGGCGCGGGGAAGTCGCTGAACAGCAACGACGACGAC
GAGTTCCGCGTGTCGCGGGGGCCGCAGGCTTTTGATGGCACGGGCCTGGAGTACGTCTTCCCC
TTCGGTGCCACGCTCTCAGTGCAGAAGCCCGCGGTGCCCGTCTTGTCCAGCGGCAAAATCGCG
TACCCCATGAACCGGCCAGTGGGTGCGGTATGGGCGCAGCCCGGCTACGGCCGCATCGCCGT
GCTGGGCTCGTGCGCCATGTTTGACGACAAGTGGCTGGACAAGGAGGAGAACTCCAAAATCA
TGGACTTCTTCTTCAAGTTCCTCGAGCCGCATTCCAAAATCCAACTCAACGACATTGACGCGG
AGGAGCCGGACGTGAGCGACCTGAAGCTGCTGCCCGACACAGCCAGTCTGGCAGACAAGCTG
AAGGGCTGCCTCCAGGAGATCGACGACGTGCCGCGCGACTGGACCTCGCTGTTCGACGACTC
GCTGTTCAAGTTCGACACCGGCCTCATCCCTGAGGCCGTGTCGCTGTACGAGAAGCTGGGCGT
GAAGAAGGGGCAGCTGAACCTCATCCCGCCCTCCTTCGAGACGCCACTGCCGCCGCTGCAGCC
CGCCGTGTTCCCGCCCACCATCCGTGAGCCGCCGCCGCCGGCGCTGGAGCTGTTCGACCTGGA
TGAGAGCTTTGCCAGCGAGACGAACCGGCTGGCCTCGCTCACCAACAAGTGCCACGGCGAGG
AGGACCTGGAGTACTACATCATGGAGGCGGGCCACATCCTGGGCCTCAAGCTGCAGGAGAAC
GCCAACGCCAAGCACGTGCTGTCGGAGGTGTTCCGCCGCATCGCGCAGTACAAGATGGGCAG
CCTGGGCCTGGGCCAGACGCTGGACTCCATGGGCCAGACCCTGCCCGCGGCCAACCAGTTCG
GCGACCAGTTCGAGCTGTAAGGAGCAGCGAGCTACAGGCCGAGCAACTGCGTGGCAGGCGGC
AGGGCGGGCGCTGGCTGCGGCGGAGGCCGAGGCGGGGGCGGCTGGCCTGGGAATGCTGCTGG
CAGCGGATGTGGAAACGTGGGGCGCCGCAGCTGCTGGAGCTGAGGCGGTTCGGGGCTGGCTG
CTGGCGTGCTGGCAGCAGGATGTGCGCTTGTGCTGATGCGGTCAGCGGAGCAGCGGGCATGC
TGGGCTGCTGAACAGAGCCACGCGGGAGGGTGTGCGGCGCGCCAACGGCAGCAGCATGCTGC
ACGCGGGGTTGTGGCCTGGCGGCGAAAAGCTGGGCATTCACCGGTGCCTCCTCTGAAAGGCG
GCTGGGCTTGGCACCGCGTGTGCCGCTTGCGGTGTGCTGGGTGTACTGGTTTCACGCGTTCTCC
AGTCTGATGAGAGGAGCCTTTATCGGATTGACAATGGTCCATGGTGAACGATGGATTATGGAT
ATCGGAGTGCACAGAGGCTGACAAGATAACGTTACAGTCCAGGAGATATGTGGTGGTAGCTG
CAGCAACTACAAGATGGCGTCAGTCAGACCCGACCTGTTTTGAGTGCTGCAGGCTGACACGCA
TGCTGACAGAACAGACGCCGCTGCAATTGCGGTTGATATTTTAGCCAGAAGGCAATATGTGGG
TGTATGCGGGGGGTGGCATGAGGCGCGCGAGTGGAGGAGTACAGGGCTGCGTCGGGCGTGCG
CGTCTGCGGTTGCAACAGTGAGCTGTGTTGGGTGTGCAAGGTGGTGGGCGTGTGCATGGAGCC
GTGTGGAGCAGTGTTCCCGTGGCGCTCAAGCGGCCCAGCATTCACTAAGCTCACGTGTAAAAC
TCATTGCGGCTGAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

(SEQ ID NO: 7)

FIG. 9B

Human

>Hs_IFT52 gi|4929575|gb|AAD34048.1|AF151811_1 CGI-53 protein [Homo sapiens]
MEKELRSTILFNAYKKEIFTTNNGYKSMQKKLRSNWKIQSLKDEITSEKLNGVKLWITAGPREKFT
AAEFEILKKYLDTGGDVLVMLGEGGESRFDTNINFLLEEYGIMVNNDAVVRNVYHKYFHPKEAL
VSSGVLNREISRAAGKAVLAIIDEESSGNNAQALTFVYPFGATLSVMKPAVAVLSTGSVCFPLNRPI
LAFYHSKNQGGKLAVLGSCHMFSDQYLDKEENSKIMDVVVFQWLTTGDIHLNQIDAEDPEISDY
MMLPYTATLSKRNRECLQESDEIPRDFTTLFDLSIFQLDTTSFHSVIEAHEQLNVKHEPLQLIQPQFE
TPLPTLQPAVFPPSFRELPPPPLELFDLDETFSSEKARLAQITNKCTEEDLEFYVRKCGDILGVTSKLP
KDQQDAKHILEHVFFQVVEFKKLNQEHDIDTSETAFQNNF (SEQ ID NO: 28)

FIG. 9C

Caenorhabditis elegans

>Ce_Osm-6 gi|2292823|emb|CAA03975.1| osm-6 [Caenorhabditis elegans]
MPPFSDEKMTNRSIGRKVLIDQSKQQQISLISGFRGVARHLKSVLTVEINTEPINLNGLEDVRMLIIP
QPKTSFGTGEIEAIWKFVEEGGSLMILSGEGGERQSLNEMIAKYGITVNKDSVIRTVFLKYFDPKEA
LVANGVINRAIAVAAKKNVSTEQKHNSQALSFIYPYGCTLDVNNRMSNVVLSSGSTSFPTSRPVAA
FHETKLNEMKKKGRVCVVGSVSMFHDTYIDKEENGKIFDTFVEFLVNGLELNTIDAAEPEINDYTN
IPDHIHMSQQIKVCMYEGELDQAISSDFMKIMDTSLHSFNLKHWPMTIRLYEALNLSPPPLTLVEPQ
FELPMPPFQPAVFPPTFQELPMPPLELFDLDEQFSSPEIQLSQLANRSEEEDLIFFIEKAGEITGISAEL
TRSERTPKKIIELAVSKLMLFKRSMMDGELEVASAFDIGEHDAHHQSFNQGEEMDEQLFSDIDEFD
DL (SEQ ID NO: 29)

FIG. 9D

IFT57

Chlamydomonas

>Cr_IFT57 predicted peptide sequence
MSSKRGGRSSLAKAPEEAVNGEAFAPEASPPPPGDDGDAGGEDGGAPAPPPPPATKGGPVAVGRS
LEIQTTPDVCMEMLADKLKLLNYEADFCRKKKPYRKPLSRLYFAVPLANSSEQFFYFTSLATWLL
GLAGVELPAPKEFDDPNLTCQNILGAVKKLGFAPPSYHPTKLTVGNGKEVVGVLDGLVDFVLERR
HHKYSRPAYGNDGQPEEGVQLDDEAEAAAMEGADELAMPAQNQADDDEEEEGVYVDPGRGDA
AGPGTGASAAMDAEKAVLVSKVDPTLWKIELERVAPKLRITIAADSKDWRSHLDEAHQHKEVISK
AWPDSKTSLERLRADLNGTLEKLQTREKFLNEQFESLMQQYRAARTTFTDVQETYNRKTEAVAD
RNQEMHRIGETLEEVKAMMDEKGSNIADATPVARIKTAIKQLNKELHDMEVRIGVVSHTLLQLSL
RNKRLLQAQAALSDEEED (SEQ ID NO: 10)

FIG. 10A

>Cr_IFT57 cDNA sequence
GTCTTGGGAACCCAGCGAGCCGCGCTCCTTGCCACATGTCCTGCTAGCTTCTGGTTTACACCGT
AGATTCATTTAAGCGAGAGACATGAGCAGCAAGCGGGGTGGGCGGTCATCCTTAGCAAAGGC
GCCCGAAGAGGCGGTAAATGGCGAGGCATTTGCGCCTGAGGCATCTCCCCCTCCACCCGGCG
ACGATGGAGATGCTGGTGGGGAGGACGGTGGCGCGCCTGCGCCCCCTCCGCCCCCGGCTACA
AAGGGCGGTCCAGTAGCTGTAGGAAGGTCGCTGGAGATACAAACAACGCCGGACGTGTGCAT
GGAAATGCTGGCCGACAAGCTGAAGCTGCTAAACTACGAGGCGGATTTCTGCAGGAAGAAGA
AGCCCTACCGGAAACCCCTCTCGCGGCTCTATTTTGCGGTGCCGCTCGCAAACTCGAGCGAGC
AGTTCTTCTACTTTACCAGTCTGGCGACCTGGCTGCTGGGCCTGGCTGGCGTGGAGCTGCCCG
CTCCCAAGGAGTTTGATGACCCGAACTTGACGTGCCAGAACATCCTGGGTGCGGTGAAGAAG
CTGGGCTTTGCGCCGCCCAGCTACCACCCTACCAAGCTCACAGTGGGCAACGGCAAGGAGGT
GGTGGGTGTGCTGGACGGGCTGGTGGACTTCGTGCTGGAGCGGCGGCACCACAAGTACAGCC
GGCCCGCGTACGGAAATGATGGGCAACCGGAGGAGGGCGTGCAACTGGACGATGAGGCGGA
GGCTGCCGCGATGGAGGGTGCGGATGAGCTGGCGATGCCAGCCCAGAACCAGGCGGATGACG
ATGAGGAGGAGGAGGGCGTATACGTGGACCCGGGGCGCGGTGACGCCGCGGGCCCAGGGAC
AGGGGCATCCGCGGCGATGGACGCGGAGAAGGCGGTGCTTGTGTCCAAGGTGGACCCCACGC
TCTGGAAGATCGAGCTGGAGCGCGTGGCGCCGAAGCTGCGTATCACCATCGCCGCCGACTCG
AAGGACTGGCGCTCACATCTGGATGAGGCGCACCAGCACAAGGAGGTGATCAGCAAGGCCTG
GCCCGACAGCAAGACGTCGCTGGAGCGCCTGCGTGCGGACCTGAACGGCACGCTGGAGAAGC
TGCAGACGCGTGAGAAGTTCCTCAACGAGCAGTTTGAGAGCCTCATGCAGCAGTACCGCGCC
GCCCGCACCACGTTCACGGACGTGCAGGAGACATACAACCGCAAGACGGAGGCGGTGGCGGA
CCGGAACCAGGAGATGCACCGCATCGGCGAGACGCTGGAGGAGGTGAAGGCCATGATGGAC
GAGAAGGGCAGCAACATCGCGGACGCCACGCCTGTGGCTCGCATCAAGACCGCCATCAAGCA
GCTTAACAAGGAGCTGCACGACATGGAGGTGCGCATCGGCGTGGTTAGCCACACGCTGCTGC
AGCTATCGCTGCGCAACAAGCGATTGCTGCAGGCGCAGGCGGCTCTCAGTGACGAGGAGGAG
GACTAGCTAGATCAGCGAGTGACAGAGGGCATGTGTGCGTACCGTGTGCGCGGGTACAGCCG
TGGGATGGAAGAGGTGATGTGGCGGGTTGCGGACCCAGCATTCGGTAGACCAGATCACTTAT
AGGTACAGAAAGACGGCTATATTGTTGGGGGCGGCGCACCCTGGCTATGTATATACAAGCCG
TAGCGCAGAGCCGCTGCAAATGCGGTGCTGTGCCTGTGCTCCCGTGGGTGTGCGGCGTTCCGG
TCAAGTTCATATAAGCTGTTGTGACTTGTGAGGCAGGCATGGCATATGGACAGGGCATCCCTG
CAAGGAAAGCAGGCAGCGGTATCCTTGTGGCGATGGGTCAAGCAGTGATGGAGGGGCGAAGC
GAGTTGCGGGCCTGTAAGCACAGGGTTGCCAAAAAAAAA (SEQ ID NO: 9)

FIG. 10B

Mouse

>Mm_IFT57 predicted peptide sequence
MAAAAAVIPPSGLDDGVSRARGEGAGEAVVERGPGAAYHMFVVMEDLVEKLKLLRYEEELLRK
SNLKPPSRHYFALPTNPGEQFYMFCTLAAWLINKTGRAFEQPQEYDDPNATISNILSELRSFGRTAD
FPPSKLKSGYGEQVCYVLDCLAEEALKYIGFTWKRPSYPVEELEEETVPEDDAELTLSKVDEEFVE
EETDNEENFIDLNVLKAQTYRLDTNESAKQEDILESTTDAAEWSLEVERVLPQLKVTIRTDNKDW
RIHVDQMHQHKSGIESALKETKGFLDKLHNEISRTLEKIGSREKYINNQLEHLVQEYRGAQAQLSE
ARERYQQGNGGVTERTRLLSEVTEELEKVKQEMEEKGSSMTDGTPLVKIKQSLTKLKQETVQMDI
RIGVVEHTLLQSKLKEKCNMTRDMHAAVTPESAIGFY (SEQ ID NO: 12)

FIG. 10C

>MmIFT57 cDNA sequence
GCGAAGGCTGCAGAGATCCTGGCCGGAGCCCAGCCGGGCGCTGGGGG
TCTGAGCAGGGATGGCCGCCGCGGCCGCGGTGATCCCGCCGTCGGGCTTGGACGATGGGGTG
TCTCGGGCTCGCGGGGAAGGCGCAGGGGAGGCTGTGGTGGAGCGCGGGCCAGGAGCGGCCTA
CCACATGTTCGTGGTGATGGAAGACTTAGTGGAGAAGCTGAAGCTGCTCCGCTACGAGGAGG
AGCTACTCCGAAAGAGCAATCTGAAGCCCCCGTCCAGACACTACTTTGCTCTGCCTACCAACC
CAGGCGAGCAGTTCTACATGTTTTGCACTCTTGCTGCGTGGCTGATCAACAAAACTGGCCGTG
CCTTTGAGCAGCCTCAAGAATACGACGATCCCAATGCAACTATATCTAATATACTCTCTGAGC
TTCGCTCTTTTGGGAGAACTGCAGATTTTCCTCCTTCAAAATTAAAGTCTGGTTACGGAGAACA
AGTGTGCTATGTTCTTGATTGCTTAGCTGAAGAAGCTTTAAAATATATTGGTTTCACTTGGAAA
AGGCCATCATACCCAGTGGAAGAACTAGAAGAAGAAACTGTTCCAGAAGATGATGCCGAGTT
AACATTAAGTAAAGTGGATGAAGAATTTGTGGAAGAGGAGACAGATAATGAAGAAAACTTTA
TTGATCTCAACGTTTTAAAGGCCCAGACCTATCGCTTGGACACAAACGAGTCTGCCAAACAAG
AAGATATTTTGGAATCTACGACAGATGCTGCGGAATGGAGCCTAGAAGTTGAGCGTGTACTAC
CGCAGCTGAAAGTCACGATTAGGACTGACAATAAGGATTGGAGGATCCATGTTGACCAAATG
CACCAGCACAAAAGTGGGATTGAATCTGCTCTGAAGGAGACCAAGGGGTTTTTGGACAAGCT
CCATAATGAAATTAGCAGGACTCTGGAAAAGATTGGCAGCCGAGAAAAGTACATTAACAATC
AACTTGAGCACTTGGTTCAAGAATATCGTGGGGCCCAAGCCCAGCTAAGTGAGGCAAGGGAG
CGCTACCAGCAGGGCAATGGCGGAGTAACTGAACGGACCAGACTCCTCTCTGAGGTTACAGA
AGAATTAGAAAAGGTAAAGCAAGAAATGGAAGAGAAGGGCAGCAGCATGACGGACGGCACT
CCTTTGGTGAAGATTAAGCAGAGCTTAACCAAGCTGAAGCAAGAAACTGTTCAGATGGACAT
TAGAATCGGTGTGGTGGAGCACACGCTACTTCAGTCAAAACTCAAGGAGAAGTGCAACATGA
CCAGGGACATGCATGCAGCTGTCACCCCAGAGTCAGCAATTGGCTTCTATTAAACACGTGGGC
TTCCATGCTTCTGATTATTTCGTTTTTATATCAAATGATTTTTTAATGTTGCATTGATTTCCAAA
CACAATTTATACTTCTTCAAGCATATTCAGTGGGTATTTTTGCACATGTGTTAATATCATGGTG
ATTATGATGGCCAAAGCCTGTACAATGAATATAGTATTTAATAAAGTACTTAAAATTAAAAAA
AAAAAAAAA (SEQ ID NO: 11)

FIG. 10D

Human

>Hs_IFT57-1 gi|7022022|dbj|BAA91466.1| unnamed protein product [Homo sapiens]
MTAALAVVTTSGLEDGVPRSRGEGTGEVVLERGPGAAYHMFVVMEDLVEKLKLLRYEEEFLRKS
NLKAPSRHYFALPTNPGEQFYMFCTLAAWLINKAGRPFEQPQEYDDPNATISNILSELRSFGRTADF
PPSKLKSGYGEHVCYVLDCFAEEALKYIGFTWKRPIYPVEELEEESVAEDDAELTLNKVDEEFVEE
ETDNEENFIDLNVLKAQTYHLDMNETAKQEDILESTTDAAEWSLEVERVLPQLKVTIRTDNKDWR
IHVDQMHQHRSGIESALKETKGFLDKLHNEITRTLEKISSREKYINNQLENLVQEYRAAQAQLSEA
KERYQQGNGGVTERTRLLSEVMEELEKVKQEMEEKGSSMTDGAPLVKIKQSLTKLKQETVEMDI
RIGIVEHTLLQSKLKEKSNMTRNMHATVIPEPATGFY (SEQ ID NO: 30)

FIG. 10E

>Hs_IFT57-2 chromosome 12 [ESTS BF089172]
DQRIHVDQMYQHKSGIESSLKESKRFFDKLHNE
ISKTLEKISHCEKYINHQLEHRVQEYPAAQTQLSDVRSQQGSGGVIERTRLLSEATED
TEHVKLEMEEKCSSMTDGDSLVKIKQSLTKLKQETVQMDIRIGVVEHTLL (SEQ ID NO: 31)

FIG. 10F

Caenorhabditis elegans

>Ce_IFT57 gi|7504754|pir||T22994 hypothetical protein F59C6.9 - Caenorhabditis elegans
MLHHIKSLKSVLSRGQEGRFGEKRHSNTTFITGIATDFTAAKLKSGAGENVIFILNSLADASLVHVG
FQWQKMIPPKEEDEDTAVDEQDEDDDNDDIVEEPMNFLDDDDDDNVIEIDLKAQGLATESKNPLQ
SVLQSNTDAITWKQEVERVAPQLKITLKQDAKDWRLHLEQMNSMHKNVEQKVGNVGPYLDNMS
KDIAKALERIASREKSLNSQLASMMSKFRRATDTRAELREKYKAASVGVSSRTETLDRISDDIEQL
KQQIEEQGAKSSDGAPLVKIKQAVSKLEEELQTMNVQIGVFEQSILNTYLRDHFNFSANLLNIM

(SEQ ID NO: 32)

FIG. 10G

IFT72

Chlamydomonas

>Cr_IFT72 partial predicted peptide sequence (lacking N-terminal end)
VYVIQQEFAALKDRNEQQRKRVDEVLTERLNLESKAKQAESK
MSEIQASMDQRLNSMPPSQRNEYTTLVAEQQQLQADSKRFEEVLDELDKALQASEGELAR
NPFKQRSLQLQEQIRALTGKKYELTEEERQSKRSPEELRADLMAKIKRDNTEVEQMTQQI
RELQDQIKKMEERVKSLGGATSGAVAAEEKANREKFEELLAKERHLNNFMDGFPSRKAAK
MQEKQQKEDGIVGVLEKMVKMQGIIGSNLPSQKKYKEMQDELEYKKMQLENTQTTQERLK
EELTMRRTELEKIDTLEDKIKLELTQLAERQEAMEKEMGEFGSVEDIQRKANAARERMGA
CAVCCLKRKDLLRSIVAERGLKFQAKRAQLQDHNLQVQLEKMEAKLKNLSAGVFEMDEFI
KAKESETNYRQLASNIAALVDDLNVHVKKAVV (SEQ ID NO: 14)

FIG. 11A

>Cr_IFT72 partial Cdna sequence (lacking 5' end)
GTGTACGTGATCCAGCAGGAGTTCGCGGCGCTCAAGGACCGCAACGAGCAGCAGCGCAAGCG
CGTGGACGAGGTGCTCACGGAGCGCCTCAACCTCGAGTCCAAGGCCAAGCAGGCCGAGTCCA
AGATGTCTGAGATCCAGGCGTCCATGGACCAGCGCCTCAACTCTATGCCGCCCAGCCAGCGCA
ACGAATACACCACGCTCGTGGCCGAGCAGCAGCAGCTGCAGGCCGACAGCAAGCGCTTTGAG
GAGGTGCTGGACGAGCTGGACAAGGCGCTGCAGGCCAGCGAGGGCGAGCTGGCGCGCAACC
CCTTCAAGCAGCGCAGCCTGCAGCTGCAGGAGCAGATCCGCGCGCTCACGGGGAAGAAGTAC
GAGCTGACGGAGGAGGAGCGGCAGAGCAAGCGCTCGCCCGAGGAGCTGCGCGCCGACCTCAT
GGCCAAGATCAAGCGAGACAACACCGAGGTGGAGCAGATGACGCAGCAGATCCGCGAGCTTC
AGGACCAGATCAAGAAGATGGAGGAGCGCGTCAAGAGCCTGGGCGGCGCCACCAGCGGCGC
GGTGGCGGCGGAGGAAAAGGCCAACCGCGAGAAGTTTGAGGAGCTGTTGGCCAAGGAGCGC
CACCTAAACAACTTTATGGACGGCTTCCCCAGCCGCAAGGCCGCCAAGATGCAGGAGAAGCA
GCAGAAGGAGGACGGCATCGTGGGCGTGCTGGAGAAGATGGTGAAGATGCAGGGCATCATTG
GCTCCAACCTGCCCAGCCAGAAGAAGTACAAGGAAATGCAGGACGAGCTCGAGTACAAGAA
GATGCAGCTGGAGAACACGCAGACCACGCAGGAGCGGCTCAAGGAGGAGCTGACCATGCGG
CGCACAGAGCTGGAGAAGATCGATACGCTGGAGGACAAGATCAAGCTGGAGCTGACGCAGCT
GGCGGAGCGGCAGGAGGCCATGGAGAAGGAGATGGGCGAGTTCGGCAGCGTCGAGGACATC
CAGCGCAAGGCCAACGCCGCACGCGAGCGCATGGGGGCCTGCGCAGTGTGCTGTTTGAAGCG
CAAGGACCTGCTGCGCTCCATCGTGGCGGAGCGCGGCCTCAAGTTCCAGGCCAAGCGCGCGC
AGCTGCAGGACCACAACCTCCAGGTGCAGCTGGAGAAGATGGAGGCCAAGCTGAAGAATCTG
AGCGCGGGCGTATTCGAGATGGACGAGTTCATCAAGGCCAAGGAGAGCGAGACCAACTACCG
CCAGCTGGCCTCCAACATAGCGGCGCTGGTAGACGACCTCAACGTGCATGTCAAGAAGGCCG
TGGTGTAAGAAGGAGGCAGTGGTGTAAGGGGTCTCCGGAGGAGGGCGCGTGCCGTTGTTGGG
GTGTTGGGGGCGCGGCGCGAGAAGTACGTGCGTGTGGCGTTGTGCCTTTCAGCAGGCTGCACG
TGTAGTACGGTAGTCAAGGTGAAGGGCGGCCTGGGCACAGGAGGATGCTGACGCCGTGACGG
GTGACGATGACAGGCCATCGCGAGTTTGATCTCTGCTGTCGAGTCATTGACTTGGGTTCCTAG
ACAGGTCGGGCTACAAGCCCGGAGGTTGATGGCTCACCTCGCAGTGCGCGGACAGCAGGTGT
GGCGCATGCGCATGTGCCTCAGGAGCGCGGTGCGGACCAGGGAAGATGCGATGGGAGTAGGC
TAGGCCTGTGTGAGGGCCCTTGCCGAAGCGCCACGGCCATTCCATGGCCTGGCCCGAAGGCA
GCGCTCGTGGTTGGATACTGACCAGCGGCGTCAAGCGGCGTACGATGTCAGAAGTGGAGCTA
CCGCCCCTGCACAAGGGGTGATGTACATACTGTTATTTAGGAGTCCGCTGCTTATAGCTACTG
GACTGCAGAAGAAGGAGGCTGCAAGGATCTGATGGAGGCGCTGGTGTGTATGGATGACGCTG
TAAGAGATGCACAAGAGAAAAAAAAAAAAAAAAA (SEQ ID NO: 13)

FIG. 11B

Human

>Hs_IFT72 gi|13376669|ref|NP_079379.1| hypothetical protein FLJ22621
MEEVMNGYNMLKAQNDRETQSLDVIFTERQAKEKQIRSVEEEIEQEKQATDDIIKNMSLENQVKY
LEMKTTNEKLLQELDTLQQQLDSQNMKKESLEAEIAHSQVKQEAVLLHEKLYELESHRDQMIAED
KSIGSPMEEREKLLKQIKDDNQEIASMERQLTDTKEKINQFIEEIRQLDMDLEEHQGEMNQKYKEL
KKREEHMDTFIETFEETKNQELKRKAQIEANIVALLEHCSRNINRIEQISSITNQELKMMQDDLNFK
STEVQKSQSTAQNLTSDIQRLQLDLQKMELLESKMTEEQHSLKSKIKQMTTDLEIYNDLPALKSSG
EEKIKKLHQERMILSTHRNAFKKIMEKQNIEYEALKTQLQENETHSQLTNLERKWQHLEQNNFAM
KEFIATKSQESDYQPIKKNVTKQIAEYNKTIVDALHSTSGN (SEQ ID NO: 33)

FIG. 11C

IFT88

Chlamydomonas

>Cr_IFT88 predicted peptide
MSYGGTEEDDLYGGYDEQSNPLAGSGGAAFKALGADGAPPGTAMMGPPGTAMKSFVPGTA
MRGGTAMQQDPSLARPMTSNRGAGFTSAPNKKFDPLNRSMGSTLGSSGGGAMLVARKGDT
SPEEQARGMEKTVHELLEKSAADAAKNDINSALENAMEAKKNERKLCRFREQNNMADQIN
LELMYAVDFNLAHMYHMNKNYSEALNLYTAIVRNKNFPQSGWLRVNMGNIHFEQKKYPSA
IKMYRMALDQISATAKEVRFKIMRNIGLSFVRMGQYPDALQSFATVMDNVPDHQTGYNLV
MCNYALSDREGMKNAFIKLLKVSPSSEMDDDDDDDPMGDDDMQVMTMDDGLKDEMRKRNT
IITRLIVKAAQLISEKVDRANGFEGGFMWCCEQLRDAGYTKLANEVELAKATRFMGQKQF
DKAVGVFKDFEKKEPRVKARAATNLAFLYFLEGETDQADKYSEMALKSDRYNARAYVNKG
CVLVERGDLEGARSLFNEAAGIDPYCVEAIYNLGLVSQRLNELPYALAAFKKLHNMVPDN
VEVIHQIATTYDMMGDFKNAVKWFELLTSLVSNDPGVLARLGAIHARFDDEAKALHYYQE
SHRVYPVNMDVISWLGAYHVKSEVYEKAMPFFDLASKIQPQEVKWALMVASCYRRTNNLP
AALGKYKQIHTQHPDNVECLRYLVHLCSELGRRAEAAEYMTKLKKAEKAAVPEATTAAAP
AAAAAGSGMGGMGGLDDDIGSSAVSAQNRGKKMLVKEHMGGGGGKDNDDWGNEQLGDDLL
PM
(SEQ ID NO: 16)

FIG. 12A

>Cr_IFT88 gi|11528334|gb|AF298884.1|AF298884 Chlamydomonas reinhardtii protein IFT88 (IFT88)
CGGCAACTTGACACTTGAGCTACTCGAAGGCAGGGCCGTGTGCAGAGCTCCTTCCCCACTATC
CTTCCTTTGCGTACCATACTTATCTTGCTAACAGCCTATAGAAGATGAGCTACGGGGGCACGG
AGGAGGATGACCTTTATGGAGGATATGATGAGCAATCGAACCCGCTTGCGGGCTCGGGTGGT
GCCGCATTTAAGGCACTTGGGGCCGATGGAGCTCCTCCAGGCACCGCCATGATGGGGCCGCCT
GGCACGGCCATGAAGAGCTTCGTGCCAGGCACGGCTATGCGGGGCGGCACGGCGATGCAGCA
GGACCCCAGCCTGGCGCGGCCTATGACCTCGAACCGGGGTGCTGGCTTCACGTCGGCGCCTAA
CAAGAAGTTTGACCCCCTCAATCGCTCAATGGGGTCGACACTGGGCTCGTCGGGGGGTGGCGC
AATGCTGGTGGCTCGCAAGGGTGACACCAGCCCGGAGGAGCAGGCGCGCGGGATGGAGAAG
ACGGTGCATGAGCTGCTTGAGAAGAGCGCGGCGGACGCGGCTAAGAATGACATCAACTCGGC
CCTGGAGAACGCCATGGAGGCGAAGAAGAATGAGCGAAAGCTGTGCCGCTTCCGGGAACAG
AACAACATGGCGGACCAGATCAACCTGGAGCTGATGTACGCCGTGGACTTCAACCTGGCACA
CATGTACCACATGAACAAGAACTACAGCGAGGCGCTGAACCTGTACACAGCCATCGTGCGCA
ACAAGAACTTCCCGCAGTCGGGTTGGCTGCGCGTCAACATGGGCAACATCCACTTCGAGCAG
AAGAAGTACCCCTCCGCCATCAAGATGTACCGCATGGCGTTGGACCAGATCAGCGCCACCGC
CAAGGAGGTCCGCTTCAAGATCATGCGCAACATCGGGCTGTCGTTCGTGCGCATGGGCCAGTA
CCCCGACGCGCTGCAGTCCTTCGCCACGGTCATGGACAACGTGCCCGACCACCAGACCGGCTA
CAACCTGGTCATGTGCAACTACGCGCTGAGCGACCGCGAGGGCATGAAGAACGCCTTCATCA
AGCTGCTCAAGGTGAGCCCATCCAGCGAGATGGATGACGATGACGACGACGACCCCATGGGC
GATGACGACATGCAAGTGATGACCATGGATGACGGGCTGAAGGACGAGATGCGCAAGCGCA
ACACCATCATCACGCGCCTCATTGTCAAGGCCGCGCAGCTCATCTCCGAGAAGGTGGATCGCG
CCAACGGCTTTGAGGGCGGCTTCATGTGGTGCTGCGAGCAGCTGCGCGACGCGGGCTACACC
AAGCTGGCCAACGAGGTGGAGCTGGCCAAGGCGACCCGGTTCATGGGGCAAAAGCAGTTTGA
CAAAGCCGTGGGCGTGTTCAAGGACTTTGAGAAGAAGGAGCCGCGCGTCAAGGCGCGCCGCG
CCACCAACCTGGCGTTCCTGTACTTCCTGGAGGGCGAGACCGACCAGGCCGACAAGTACAGC
GAGATGGCGCTCAAGAGCGACCGCTACAACGCACGAGCCTACGTCAACAAGGGATGCGTGCT
GGTGGAGCGCGGCGATCTGGAGGGAGCGCGAAGCCTGTTCAACGAGGCTGCCGGCATCGACC
CCTACTGCGTGGAGGCCATCTACAACCTGGGCCTGGTGAGCCAGCGCCTGAACGAGCTGCCGT
ACGCGCTGGCGGCGTTCAAGAAGCTGCACAACATGGTGCCCGACAACGTGGAGGTCATCCAC
CAGATCGCCACCACGTACGACATGATGGGCGACTTCAAGAACGCGGTCAAGTGGTTTGAGCT
GCTCACCTCGCTGGTCAGCAACGACCCCGGCGTGCTGGCGCGACTGGGAGCCATCCACGCCA
GGTTCGACGACGAGGCCAAGGCGCTGCACTACTACCAGGAGTCGCACCGCGTGTACCCGGTG
AACATGGACGTCATCTCCTGGCTGGGCGCCTACCATGTCAAATCGGAGGTGTACGAGAAGGC
CATGCCCTTCTTTGACCTGGCCTCCAAGATCCAGCCGCAGGAGGTCAAGTGGGCGCTCATGGT
GGCGTCCTGCTACCGCCGCACCAACAACCTGCCCGCCGCGCTGGGCAAGTACAAGCAAATCC
ACACGCAGCACCCCGACAACGTTGAGTGCCTGCGCTACCTGGTGCACCTGTGCTCCGAGCTGG
GCCGCCGCGCCGAGGCCGCCGAGTACATGACCAAGCTCAAAAAGGCGGAGAAGGCGGCGGT
GCCCGAGGCAACGACAGCGGCGGCGCCCGCCGCGGCCGCAGCTGGCAGTGGCATGGGTGGCA
TGGGCGGCCTGGACGACGACATTGGCAGCAGCGCGGTGTCGGCGCAGAACCGCGGCAAGAAG
ATGCTGGTCAAAGAGCACATGGGTGGCGGCGGTGGCAAGGACAACGACGACTGGGGAAACG
AGCAGCTTGGGGACGACCTGCTGCCCATGTAAACCGCAGTGCTGCCACAGGGCTTGGCGGGG
GCGGGGCGTCAGCGCAGCCAGTGGGGCTACCGCCGCGGCCTGGCGGAGGTGGCGGCGGCGCA
GCTGGCGGAGCCATGCGCGCCCAGGGCCAGGGGCTGTGGGGAGGTGATGGCGAGGGCGAGG
ACGACGACCACCTAAAAGCGCTGGGGCTGGGGGTGGGGTTGGTGGGCGGCCGCAGCGGGGGC
GCGCTGTCTGCCGGCACGGGGCGCGTGAAGGCCGATGTCAGCCGCGCCGCCTCTCACCCGGA
GTTCGGGGCCGAGCCTGCGTTTGGAAAGGTGCTGAGCTTTGGCTCGGCTGGGACGTCCAGCGC
ACTGCCTGAGCTGGCGTAAAGCCATTACCGCTGATGCAGCCCGCCATTCGTGTGTGTGCGTAT
ATGTGTGTGAATGTATGTGTGTGCTAGGTAAGCACGAGATGCGTGTGCGTTTGCTGGTTCGCG
CTGCGCCACTTTTGGCTGCAGGGGTCCCCAGGTCAGTGTGAAGCCCGGCCCGGGCGGAAATG
GGTGCATGGCAGTTGCGGCGCATGCATGCGGAAGTGAGCGAAGTGCAATAGGCTCCTGCAGG
GCATGGATGCGTAGGAACAGGGCTTGAATGATATCACTATGTGGCGTTGACGGGCCCACAAC
TTACATGGGAGAGGCACGCCGAAAGGGTGTGTGAGGATCAGGAGCTTGGACTTGCCGTAGTG
CTGTACATGGTGCCAGTCTACGTGCGGGCATAGACACATACAGGACCTGTGCTGCTGCGGAGT
CCGCATCTGCAGGAAGTCGTGCCGGGTGTCACGAGTGCGGACGATGCGGATTGTGGAGGAGT
ACAGATGGGGCCATCGGACATACTGGCACAGTGGCACCACCGGCCCCCTGCGACGCATGCTC
GCACGACCCTGTAAAGGTCGAGCCCAAAAAA (SEQ ID NO: 15)

FIG. 12B

Humans

>gi|5729800|ref|NP_006522.1| Tg737 protein; Probe hTg737 (polycystic kidney disease)
MMQNVHLAPETDEDDLYSGYNDYNPIYDIEELENDAAFQQAVRTSHGRRPPITAKISSTAVTRPIA
TGYGSKTSLASSIGRPMTGAIQDGVTRPMTAVRAAGFTKAALRGSAFDPLSQSRGPASPLEAKKK
DSPEEKIKQLEKEVNELVEESCIANSCGDLKLALEKAKDAGRKERVLVRQREQVTTPENINLDLTY
SVLSNLASQYSVNEMYAEALNTYQVIVKNKMFSNAGILKMNMGNIYLKQRNYSKAIKFYRMALD
QVPSVNKQMRIKIMQNIGVTFIQAGQYSDAINSYEHIMSMAPNLKAGYNLTICYFAIGDREKMKK
AFQKLITVPLEIDEDKYISPSDDPHTNLVTEAIKNDHLRQMERERKAMAEKYITTSAKLIAPVIETSF
AAGCDWCVEVVKASQYVELANDLEINKAVTYLRQKDYNQAVEILKVLEKKDNRVKSAAATNLS
ALYYMGKDFAQASSYADIAVNSDRYNPAALTNKGNTVFANGDYEKAAEFYKEALRNDSSCTEAL
YNIGLTYEKLNRLDEALDCFLKLHAILRNSAEVLYQIANIYELMENPSQAIEWLMQVVSVIPTDPQ
VLSKLGELYDREGDKSQAFQYYYESYRYFPCNIEVIEWLGAYYIDTQFWEKAIQYFERASLIQPTQ
VKWQLMVASCFRRSGNYQKALDTYKDTHRKFPENVECLRFLVRLCTDLGLKDAQEYARKLKRL
EKMKEIREQRIKSGRDGSGGSRGKREGSASGDSGQNYSASSKGERLSARLRALPGTNEPYESSSNK
EIDASYVDPLGPQIERPKTAAKKRIDEDDFADEELGDDLLPE (SEQ ID NO: 34)

FIG. 12C

Caenorhabditis elegans

>Ce_Osm-5 gi|12659061|gb|AAK01173.1|AF314195_1 OSM-5 [Caenorhabditis elegans]
MANSTFREDDDDFYGGFDSYDKAYDIQNITQNPQFQQAVARSSHGRRPTASQMGFRDASSSYGKP
PGTMMGNQSRMGGRTAMANNNEPARPMTAVRGAGYTSFANKVQAAERPLSTENSGENGEEKCR
QMENKVMEMLRESMLASEKKKFKEALDKAKEAGRRERAVVKHREQQGLVEMMNLDLTFTVLF
NLAQQYEANDMTNEALNTYEIIVRNKMFPNSGRLKVNIGNIHFRKREFTKALKYYRMALDQVPSI
QKDTRIKILNNIGVTFVRMGSYDDAISTFDHCVEENPNFITALNLILVAFCIQDAEKMREAFVKMIDI
PGFPDDDYMKEKDDDDVLLNQTLNSDMLKNWEKRNKSDAEKAIITAVKIISPVIAPDYAIGYEWC
LESLKQSVHAPLAIELEMTKAGELMKNGDIEGAIEVLKVFNSQDSKTASAAANNLCMLRFLQGGR
RLVDAQQYADQALSIDRYNAHAQVNQGNIAYMNGDLDKALNNYREALNNDASCVQALFNIGLT
AKAQGNLEQALEFFYKLHGILLNNVQVLVQLASIYESLEDSAQAIELYSQANSLVPNDPAILSKLA
DLYDQEGDKSQAFQCHYDSYRYFPSNLETVEWLASYYLETQFSEKSINYLEKAALMQPNVSKWQ
MMIASCLRRTGNYQRAFELYRQIHRKFPQDLDCLKFLVRIAGDLGMTEYKEYKDKLEKAEKINQL
RLQRESDSSQGKRHSANSTHSLPPSGLTGLGSGSGGSSGGGTRQYSAHVPLLLDSGTPFTVAQRDM
KAEDFSYDDPVAISSRPKTGTRKTTTDTNIDDFGDFDDSLLPD (SEQ ID NO: 35)

FIG. 12D

IFT122

Chlamydomonas

>Cr_IFT122 partial predicted peptide sequence (lacking N-terminal end)
HEGHFRRAPHFAYAKETLLKMDDTKGLITLYVEAEKWDDAFLLLHAHPECRQDVYLPYAKWLSN
QDRFDEARLAYQEGGFPSLATRILEQLCANAVVETRYADAAFYYYQLAMEALKSIKNPPSNMAPS
DRSALERFTELYDRAEVYYAYEVVHKSVHSPFRTTHPDTLFNASRFLLMRLLPPREVPLGVSVVN
VVYVLAKQAVEAGAFKLARFAYNKLQTLVLPAAWQAEVDLASVVIRSKPFSDKEDLLPVCWRCS
TTNPLLNTQGDYCINCGAPFIRSFVTFEHLPVVEFELEPGVDDEEAGRLLGEDAGMEAARRERKAE
RQAKAAEVGGNMLRLDQNEIDRMDDAFAAQMMVPNTTIRVDRAMLRRLKTAEVMVRTWPNPV
IPKQYFRSHGPGGAAVLQDPADTSSSRMSSRWRRWSVARRPSAAPPCAARAWRRARTPRMRVPA
ATSWAGRWAARVGPLGAPARRACPCPSSRAGRWCERGRLSGAYRVRGWIPDVGGE

(SEQ ID NO: 18)

FIG. 13A

>Cr_IFT122 partial cDNA sequence (lacking 5' end)
GGCACGAGGGCCACTTCCGCCGCGCGCCGCACTTTGCGTACGCCAAGGAGACGCTGCTCAAA
ATGGACGACACCAAGGGCCTGATCACGCTGTACGTGGAGGCTGAGAAGTGGGATGACGCCTT
CCTGCTGCTGCACGCGCACCCCGAGTGCCGGCAGGACGTGTACCTGCCCTACGCCAAGTGGCT
CAGCAACCAGGACCGCTTCGATGAGGCGCGGCTGGCGTACCAGGAGGGCGGCTTTCCCAGCC
TGGCCACCCGCATCCTGGAGCAGTTGTGCGCCAACGCGGTGGTAGAGACGCGGTACGCGGAC
GCCGCCTTCTACTACTATCAGCTGGCCATGGAGGCGCTCAAGAGCATCAAGAACCCGCCCTCC
AACATGGCGCCCTCGGACCGCTCCGCGCTGGAGCGCTTCACGGAGCTGTACGACCGCGCCGA
GGTGTACTACGCCTACGAAGTGGTGCACAAGTCCGTGCACTCGCCCTTCCGCACCACGCACCC
CGACACGCTCTTCAACGCCTCGCGCTTCCTGCTCATGCGCCTGCTGCCGCCGCGCGAGGTGCC
GCTGGGCGTCAGCGTGGTCAACGTGGTGTACGTGCTGGCCAAGCAGGCTGTCGAGGCGGGCG
CCTTCAAGCTGGCGCGCTTCGCGTACAACAAGCTGCAGACGCTGGTGCTGCCGGCGGCCTGGC
AGGCGGAGGTGGACCTGGCATCCGTGGTCATCCGCTCCAAGCCTTTCTCAGACAAGGAGGAC
CTGCTACCGGTGTGCTGGCGCTGCTCCACCACCAACCCGCTGCTCAACACGCAGGGCGACTAC
TGCATCAACTGCGGCGCGCCCTTCATCCGCTCCTTCGTCACCTTCGAGCACCTGCCCGTGGTGG
AGTTTGAGCTGGAGCCGGGCGTGGACGACGAGGAGGCGGGCCGCCTGCTGGGCGAGGACGCG
GGCATGGAGGCGGCGCGGCGCGAGCGCAAGGCGGAGCGGCAGGCCAAGGCGGCGGAGGTGG
GCGGCAACATGCTGCGGCTGGACCAGAACGAGATCGACCGCATGGACGACGCCTTCGCGGCC
CAGATGATGGTGCCCAACACCACCATCCGCGTGGACCGGGCCATGCTGCGGCGGCTCAAGAC
GGCCGAGGTCATGGTGCGCACCTGGCCCAACCCCGTCATCCCCAAGCAGTACTTCCGCAGTCA
TGGACCAGGAGGTGCCGCTGTGCTGCAGGACCCTGCGGACACTTCTTCGAGCAGGATGAGTTC
GAGATGGCGGCGCTGGAGCGTGGCACGGCGCCCTTCAGCCGCACCACCGTGCGCGGCGAGGG
CCTGGCGCCGGGCGAGGACGCCGAGGATGAGGGTGCCGGCGGCAACAAGCTGGGCGGGCCG
TTGGGCAGCGCGCGTGGGCCCATTGGGGGCGCCAGCAAGGCGCGCATGTCCGTGCCCTTCCA
GCAGGGCCGGCCGCTGGTGTGAGCGGGGTCGCCTATCGGGCGCTTACCGGGTGCGTGGGTGG
ATTCCGGATGTAGGCGGGGAATAGGAGCTGCCGGTAGTGGCGTTGCAGCAGGCCTTCGTTAC
GCAGCAGAGGGGGCACGAGGAGGACGTGAACGGGTGTCTTCATGCTGCTTGTGGTCTGACTT
GGTAGGACGGGCGTTGGTGCCATCATTAGGCTGCCCCTGCCGGTCCACCATAGGAGCTGCGAT
GGGCCTGAAGCAAGGCCCATGCACGGTGGCCGGGCACATGATGCATGACGGGACAGAGCACG
GGACTTGCTGGAACCAGTGTACATATGCCCGCGCAGAGACTGCGTGTCTCGAAGCGGGCACA
AATTGGGACATGTCGGCGTACAGACAAACGATGATGATGACAGGATGACAGTTGTTGTGCGG
CAGGGGGGCTCCCAAGCCCAGTTGAGGCCCAGGCAGGTTTGGTTGAATGGGGATGCACAGTG
GCAGTGCTAATGCGCTGGCGCTATGAGCGTCCATGGTGTTGGCGGCCTCAAGTACAAGACACC
TTATAGTAGTTCAATCTGCCCCGCAAAAAAAAAAAAAAAAAA (SEQ ID NO: 17)

FIG. 13B

Human

>gi|11360072'pir||T43484 hypothetical protein DKFZp434K016.1 - human (fragment)
TLLQPLKGHKDTVYCVAYAKDGKRFASGSADKSVIIWTSKLEGILKYTHNDAIQCVSYNPITHQLA
SCSSSDFGLWSPEQKSVSKHKSSSKIICCSWTNDGQYLALGMFNGIISIRNKNGEEKVKIERPGGSLS
PIWSICWNPSSRWESFWMNRENEDAEDVIVNRYIQEIPSTLKSAVYSSQGSEAEEEEPEEEDDSPRD
DNLEERNDILAVADWGQKVSFYQLSGKQIGKDRALNFDPCCISYFTKGEYILLGGSDKQVSLFTKD
GVRLGTVGEQNSWVWTCQAKPDSNYVVVGCQDGTISFYQLIFSTVHGLYKDRYAYRDSMTDVIV
QHLITEQKVRIKCKELVKKIAIYRNRLAIQLPEKILIYELYSEDLSDMHYRVKEKIIKKFECNLLVVC
ANHIILCQEKRLQCLSFSGVKEREWQMESLIRYIKVIGGPPGREGLLVGLKNGQILKIFVDNLFAIVL
LKQATAVRCLDMSASRKKLAVVDENDTCLVYDIDTKELLFQEPNANSVAWNTQCEDMLCFSGG
GYLNIKASTFPVHRQKLQGFVVGYNGSKIFCLHVFSISAVEVPQSAPMYQYLDRKLFKEAYQIACL
GVTDTDWRELAMEALEGLDFETAKKAFIRVQDLRYLELISSIEERKKRGETNNDLFLADVFSYQG
KFHEAAKLYKRSGHENLALEMYTDLCMFEYAKDFLGSGDPKETKMLITKQADWARNIKEPKAAV
EMYISAGEHVKAIEICGDHGWVDMLIDIARKLDKAEREPLLLCATYLKKLDSPGYAAETYLKMGD
LKSLVQLHVETQRWDEAFALGEKHPEFKDDIYMPYAQWLAENDRFEEAQKAFHKAGRQREAVQ
VLEQLTNNAVAESRFNDAAYYYWMLSMQCLDIAQDPAQKDTMLGKFYHFQRLAELYHGYHAIH
RHTEDPFSVHRPETLFNISRFLLHSLPKDTPSGISKVKILFTLAKQSKALGAYRLARHAYDKLRGLYI
PARFQKSIELGTLTIRAKPFHDSEELVPLCYRCSTNNPLLNNLGNVCINCRQPFIFSASSYDVLHLVE
FYLEEGITDEEAISLIDLEVLRPKRDDRQLEIANNSSQILRLVETKDSIGDEDPFTAKLSFEQGGSEFV
PVVVSRLVLRSMSRRDVLIKRWPPPLRWQYFRSLLPDASITMCPSCFQMFHSEDYELLVLQHGCCP
YCRRCKDDPGP (SEQ ID NO: 36)

FIG. 13C

Caenorhabditis elegans

>Ce_Daf10 Z82266 F23B2.4
MTMKKISRKLGFHGEQVCIYDLAFKPDGSELLLAADNKVYLFDVNEGGQMQTLKGHKDLVYTV
AWSHNGELFASGGADKLVILWNEKHEGTLRYSHTDVIQCMMFNPCNQILLTCALNEFGLWSTAD
KNVIKQRSVVRCCSCAWNTDGTIFAIGHGDGTITLRKGTNATEEPSIIIQRDNEPIWGIAFSSNRTFA
SRDSQGNPMGIDEIMAVIDWNKTLSFYSLDGTFIESKNLEFEPHCISYCLNGEYLLIGGSDKILKIYT
RKGVLLGTVAQMDHWIWSVTVRPNSQTVAMGCVDGTIACYNLVFSTVHCVDHARYANRKSMT
DVFVQNLEYRTSSNICCHDLVKKMSLYDTKLAVQLSDKIQIYKQTGGVSKNERRKQLKYTLQDTI
RKDLSFSLMVVTHGHLVVCNDEKLECYDFKGIKKRSWNMKSIVRYLRVLGGPAHRETLVLGTTD
GGVYKVFIDNDYPILLDSRKTAIKCIDINANRTVLASIEDTLVCKWSDIATGETLLQEPGCYSVVFN
TVNENLFAFTTNNMLHVRTLAAPGHTTRGVGYVLGFVKNRTFCLVQYNLIPLEVPYTIHLYQYIER
GDFKEALRIACLGVVKNDWKYLANKALDALEFDVARKAYKRVRDRKMLRMVWELKKMKSNG
EPDAILRATILAYTKKFREAAKIFKENGFENRAMELFTDMRMFDDVQEVMTTASGETKKMLMRK
RASWARDANQPKIAAEMLISSGDLDKAALLIIDNDWLELAIEISHKIDRSDLETMKKLSAYFIRKHE
FGLASRIFQSINDMKSIVDMHVNAGHWTDAFAIADRHPKYVEDVYLPYARFLAERDRFEEAQKAF
HRAGKEQEAMHVLEQLTSNSVNENRFADAGCGLNNPLLGGMSCIHCETPFIISFVSFDILPLIEFKIE
NDISFDEAKELIESEPPLSDDDYNPLRGLKKGIKEIILNRESLSKLEQGHVIIQTFPPPLAPKFLFNVMP
SITIAQCKGCNKVFDLDDFEMACLRKGHCPFCRTSYDRNEAFFVDEEEDEDNTNIPSFGQFSRFS

(SEQ ID NO: 37)

FIG. 13D

IFT139

Chlamydomonas

>Cr_IFT139 partial predicted peptide sequence (lacking C-terminal end)
MADRVLALVHYYAREGYFRHVQTVCNEVLKKRPGDGVLTFWRAYGLLMEGNTADAMRDLSSIQ
GNSDLELAVAAAQLLGHESAKVPDHDAIIDLQAKLEIEERTASDQPCLHLASFYLYTKSKERARGL
VERVLRNQPDMVPAQVLLGWIIISQQQDDEYDMLFDESELDDALSHFEQAVEHDHNDLQALLGK
AKIMELKKQLGPCLDVLTEINVRFGWFVPALVEKTRMLMMLGDWEQVTETLQRVLAADQQNIM
AQAWNCMISLTREGNNKQAAKQLQDLFSSMNRQEPKNAELFFRVARPFGRLACSDPTLLGITYLM
ADRAAQLRPEMAAYVVEAAAQKLMMDETTNATERFTQALQLDELNLEANAGALEAQIMAGELE
EAAGQIMFLEDMFTNAAAAGGGKRKGRGTGDMDDDPDMADPSLGTSSDNPTLLYLKGLLAWKQ
GMPSEGLGLLERSIAALFSAAADFHGPSLELYAALNPARITAMVRLLLQSIGGEPRAPTEAPSPLISK
VTRALDLLNKQAPALQESALLHARALYLNGNLDGALRKAGEILRMNPEESSAHLLICSVYVAQDK
PELAVSALDQAVSSNFAIRETPLYHVVQAKVLVANNKLDDAKRVLESAMNLPGVRTALTVQQRA
RLGRKVVEPTLHERATVYLLLADVLARQSKIPDAPEAKKYIQDAIREFEGTSEEVRVTVADCELAI
ARGDVEGALKKLRRIPKESPHYVKARMAMADIYLRHRKDKAAYIKCYMDLVDHTPDYDSYCML
GEAFMQIQEPEKAVRA (SEQ ID NO: 20)

FIG. 14A

>Cr_IFT139 partial Cdna sequence (lacking 3' end)

GGGTAGTCGTAACGTCTCAAGTATCGGACGCACTATTTGCAACTGCTTATTTTCGCATGGCTCC
CCCATCAATGAACTTGCTTCGTCCCTATGGCCTCCCATCGAGCGTGCAAGGTATCACCGTGTAT
ACACATGCTAAATATACTTCGTTAAATTGGAGTTCACCGCGGAGGCCTGAACATTTGCCGAAC
CGCTCCTGAGGAAGCAGAACGAATAGCAGTGCATACAAATAGCCATGGCGGACAGGGTACTT
GCCCTGGTCCATTACTATGCTCGCGAGGGCTATTTTAGACATGTGCAGACGGTGTGCAACGAA
GTGCTCAAGAAGCGGCCGGGAGATGGCGTACTCACATTCTGGCGTGCCTATGGACTGCTCATG
GAGGGCAACACGGCGGACGCCATGCGTGACCTCTCCAGCATCCAGGGCAATTCTGACCTTGA
GCTGGCGGTCGCAGCCGCGCAACTACTGGGTCACGAATCCGCCAAGGTGCCCGACCACGATG
CCATCATTGACCTCCAAGCCAAGCTGGAGATCGAGGAGCGCACCGCCAGCGACCAGCCCTGC
CTGCACCTGGCCTCCTTCTACCTGTATACCAAGTCCAAGGAGCGCGCCCGCGGTCTGGTGGAG
CGCGTGCTGCGCAACCAGCCCGACATGGTGCCGGCGCAGGTTCTTCTGGGCTGGATCATCATC
AGCCAGCAGCAGGACGACGAGTACGACATGCTGTTTGACGAGTCCGAGCTGGACGACGCCCT
CAGCCACTTCGAGCAGGCGGTGGAGCACGACCACAACGACCTGCAGGCGCTGCTGGGCAAAG
CCAAGATCATGGAGCTGAAGAAGCAGCTGGGGCCCTGCCTGGACGTGCTGACGGAGATCAAC
GTGCGCTTCGGCTGGTTCGTGCCGGCGCTGGTGGAAAAGACGCGCATGCTCATGATGCTGGGC
GACTGGGAGCAGGTGACGGAGACGCTGCAGCGGGTGCTTGCGGCGGACCAACAGAACATCAT
GGCGCAGGCCTGGAACTGCATGATCTCCCTCACTCGCGAGGGCAACAACAAGCAGGCGGCCA
AGCAGCTGCAGGACCTGTTCAGCTCAATGAACCGCCAGGAGCCCAAGAACGCCGAGCTCTTC
TTCCGCGTCGCCCGGCCC TTCGGCCGCCTGGCCTGCAGCGACCCCACGCTGCTGGGCATCACC
TACCTCATGGCCGACCGCGCCGCGCAGCTCAGGCCGGAGATGGCGGCCTACGTGGTGGAGGC
AGCTGCTCAGAAGCTGATGATGGACGAGACCACCAACGCCACGGAGCGCTTCACGCAGGCGC
TACAGCTGGACGAGCTGAACCTGGAGGCCAACGCGGGCGCGCTGGAGGCGCAGATCATGGCG
GGCGAGCTGGAGGAGGCGGCGGGGCAGATCATGTTCCTGGAGGACATGTTCACCAACGCCGC
GGCGGCTGGCGGCGGCAAGCGCAAGGGCCGCGGCACCGGCGACATGGACGACGACCCCGAT
ATGGCCGACCCCAGTCTGGGCACCTCCTCCGACAACCCCACGCTGCTCTACCTCAAGGGTCTG
CTGGCCTGGAAGCAGGGCATGCCGTCCGAGGGCCTGGGTCTGCTGGAGCGCTCCATTGCCGCC
CTGTTCTCCGCCGCCGCCGACTTCCACGGCCCCAGCCTGGAGCTGTACGCGGCGCTCAACCCG
GCGCGCATCACCGCAATGGTGCGGCTGCTGCTGCAGAGCATCGGCGGTGAGCCGCGCGCTCC
CACTGAGGCGCCGTCTCCGCTCATCAGCAAGGTCACCCGCGCGCTGGACCTGCTGAACAAGCA
GGCGCCGGCGCTGCAGGAGAGCGCGCTGCTGCACGCGCGCGCGCTGTACCTGAACGGCAACC
TGGACGGCGCGCTGCGCAAGGCGGGCGAGATCCTGCGCATGAACCCCGAGGAGAGCTCCGCG
CACCTGCTCATCTGTTCCGTGTACGTGGCGCAGGACAAGCCCGAGCTGGCCGTCAGCGCGCTG
GACCAGGCCGTCAGCAGCAACTTCGCGATCCGCGAGACGCCTCTGTACCACGTGGTCCAGGCC
AAGGTGCTGGTGGCCAACAACAAGCTGGACGACGCCAAGCGCGTCCTGGAGTCCGCCATGAA
CCTGCCGGGCGTGCGCACAGCGCTCACCGTGCAGCAGCGCGCGCGACTAGGGCGCAAGGTGG
TCGAGCCCACGCTGCACGAGCGCGCCACCGTGTACCTGCTGCTGGCGGACGTGCTGGCGAGG
CAGTCCAAGATACCGGACGCACCAGAGGCCAAGAAGTACATCCAAGACGCCATCCGCGAGTT
CGAGGGCACCAGCGAGGAGGTGCGCGTCACGGTGGCGGACTGCGAGCTGGCCATTGCGCGCG
GCGACGTGGAGGGCGCGCTCAAGAAGCTGCGGCGCATCCCCAAGGAGTCTCCGCACTACGTG
AAGGCGCGCATGGCCATGGCCGACATCTACCTGCGCCACCGCAAGGACAAGGCCGCCTACAT
CAAGTGCTACATGGACCTGGTGGACCACACGCCCGACTACGACAGCTACTGCATGCTGGGCG
AGGCGTTCATGCAGATCCAGGAGCCGGAGAAGGCAGTGCGCGCT (SEQ ID NO: 19)

FIG. 14B

Human

>Hs_IFT139-1 ref|NT_005498.3|Hs3_5655 Homo sapiens chromosome 3
SFIQAGIIYYSQEKYFHHVQAAAVGLEKFSNDPVLKFFKAYGVLKEDREAIQELEYSLKEIRKTVSG
TALYYAGLFLWLIGRHDKAKEYIDRMLKISRGFREAYVLRGWVDLTSDKPHTAKKAIEYLEQGIQ
DTKDVLGLMGKAMYFMMQQNYSEALEVVNQITVTSGSFLPALVLKMQLFLARQDWEQTVEMG
HRRILEKDESNIDACQILTVHELAREGNMTTQATNHVRNLIKALETREPENPSLHLKKIIVVSRLVC
GSHQVILGLVCSFIERTFMATPSYVHVATELGYLFILKNQVKEALLWYSEAMKLDKDGMAGLTGII
LCHILEGHLEEAEYRLEFLKEVQKSLGKSEVRAPWGYGLLQDDVLCCPPTPTFQCKVAWTFTLPLP
TKSAQADIGTETRSSLPQVLIFLQALLMSRKHKGEEETTALLKEAVELHFSSMQGIPLGSEYFEKLD
PYFLVCIAKEYLLFCPKQPRLPGQIVSPLLKQVAVILNPVVKAAPALIDPLYLMAQVRYYSGELEN
AQSILQRCLELDPASVDAHLLMCQIYLAQGNFGMCFHCLELGVSHNFQVVRDHPLYHLIKARALN
KAGDYPEAIKTLKMVIKLPALKKEEGRKFLRPSVQPSQRASILLELVEALRLNGELHEATKVMQDT
INEFGGTPEENRITIANVDLVLSKGNVDVALNMLRNILPKQSCYMEAREKMANIYLQTLRDRRLYI
RCYELCEHLPGPHTSLLLGDALMSILEVSERPHSLAKWPPSLPSPVGEKRKTQRHFPHQPEKALEV
YDEAYRQNPHDASLASRIGHAYVKAHQYTKAIEYYEAAQKINGQDFLCCDLGKLLLKLKKVNKA
EKVLKQALEHDIGVQDIPSMMNDVKCLLLLAKVYKSHKKEAVIETLNKVIDRWTQALALDLQSRI
LKRVPLEQPEMIPSQKQLAASICIQFAEHYLAEKEYDKAVQSYKDVFSYLPTDNKVLMADLMFRK
QKHEAAINLYHQVLEKAPGDNFLVLHKLIDLLRRSGKLEDIPAFFELAKKVSSRVPLEPGFNYCRGI
YCWHIGQPNEALKFLNKARKDSTWGQSAIYHMVQICLNPDNEVVGGEAFENLIPRSNTCSYMEKK
ELEQQGVSTAEKLLREFYPHSDSSQTQLRLLQGLCRLATREKANMEAALGSFIQIAQAEKDSVPAL
LALAQAYVFLKQIPKARMQLKRLAKTPWVLSEAEDLEKSWLLLADIYCQGSKFDLALELLRRCVQ
YNKAQSCYKAYEYMGFIMEKEQSYKDAVTNYKLAWKYSHHANPAIGKATSQGARETWEGGGQ
EPHHDPRTQGLYPGCYENQRGSQVTRVPPSLLSMSPVGFKLAFNYLKDKKFVEAIEICNDVSQQP
WWGGPGVVVGNPA (SEQ ID NO: 38)

FIG. 14C

>Hs_IFT139-2 ref|NT_005239.3|Hs2_5396 Homo sapiens chromosome 2
INYYCQERYFHHVLLVASEGIKRYGSDPVFRFYHAYGTLMEGKTQEALREFEAIKNKQDVSLCSLL
ALIYAHKDREAILESDARVKEQRKGAGEKALYHAGLFLWHIGRHDKAREYIDRMIKISDGSKQGH
VLKAWLDITRGKEPYTKKALKYFEEGLQDGNDTFALLGKVSWRQNYSGALETVNQIIVNFPSFLP
AFVKKMKLQLALQDWDQTVETAQRLSNKIIFFSFCGRSQLILQKIQTLLERAFSLNPQQSEFATELG
YQMILQGRVKEALKWYKTAM TLDETSVSALVGFIQCQLIEGQLQDADQQLEFLNEIQQSIGKSAV
LIYLHAVLAMKKNKRQEEVINLLNDVLDTHFSQLEGLPLGIQYFEKLNPDFLLEIVMEYLSFCPMQ
VSNYGFLLGDIEAAFNNLQHCLEHNPSYADAHLLLAQVYLSQEKVKLCSQSLELCLSYDFKVQVR
DYPLYHLIKAQSQKKMGEIADAIKTLHMAMSLPGMKRIGASTKSKDRKTEVDTSHRLSIFLELIDV
HRLNGEHEATKVLQDAIHEFSGTSEEVRVTIANADLALAQGDIERALSILQNVTAEQPYFIEAREK
MADIYLKHRKDKMLYITCFAITYYEAALKTGQKNYLCYDLAELLLKLKWYDKAEKVLQHALAH
EPGMKARELQARVLKRVQMEQPDAVPAQKHLAAEICAEIAKHSVAQRDYEKAIKFYREALVHCE
TDNKVDNYMTLSRLIDLLRRCGKLEDVPRFFSMAEKRNSRAKLEPGFQYCKGLYLWYTGEPNDA
LRHFNKARKDRDWGQNALYNMIEICLNPDNETVGGEVFENLDGDSNSTEKQESVQLAVRTAEKL
LKELKPQTVQGHVQLRIMENYCLMATKQKSNVEQALNTFTEIAASEKEHIPALLGMATAYMILKQ
TPRARNQLKRIAKMNWNAIDAEEFEKSWLLLADIYIQSAKYDMAEDLLKRCLRHNRSCCKAYEY
MGYIMEKEQAYTDAALNYEMAWKYSNRTNPAVG (SEQ ID NO: 39)

FIG. 14D

Caenorhabditis elegans

>gi|7511091|pir||T29012 hypothetical protein ZK328.7 - Caenorhabditis elegans
MKVAANELAISTIHFLPGHIEKAKASIMMKDWRGVMDCIMNADQPEGSNPYIEVLRTVHGICYAG
EVSMLKRTLQLLLKSLDENEATNHVLYARITKLLVSISGRDEKILRHARDFLTRALKISRKPDYVAL
SMRIAFGLGGAKEVSTLSQELVALDCEDSYAVLSSVVSMLMISRVSDARAQFDILPSAHPKLLESPL
YYLIASVLAKQSKDKSFENFRQHIENLVEMLRNQLQSFPFGLDYLSLFSSDLLYSAVEQCFDFYPLV
PIKAPDDCMKLTAKTLQMIYDVAPGLAHCTLQLARNSYLCSNTNAAEKWIEKVLDKDDSLADAHI
LRAELILDRGGKITDADDALVTGLNFNFKLRETSLYHLIKSKTFKKRNENDEAIKTLKMALQIPRKE
PSKNLFQPKESADTHKISVQLELIDTLQHMKRIQEAETTMTDALAEWAGQPEQDQLVIAQAQLYL
TKGHVERALGILKKIQPGQSNFHLSRIKMAEIYLEEKKDKRMFAACYRELLKVEATPGSYSLLGDA
FMKVQEPEDAINFYEQALKMQSKDVQLAEKIGEAYVMAHLYSKAVNFYESSMNIYKDKNMRLK
LANLLLKLRNFEKCEKVLRAPFERDPEPVGTETIQTYIQFLLLLAECHEMMDNVPEAMNDFEKAKS
LHSRIQDKTLTAALKKEGARICNLQAELLYRRREFSQAVDICKQALAYHETDLKANLLLSKIFKEE
NKWTLVLQPCQTVIQVDPHNDEANSILADFYYIRSEAAHASTSYTTLLNTNPQHWHALSRVVELF
CRNGEQNAAEKHLDRAKEVNPRCVTESGYNVCRGRFEWYTGDQNEALRYYSRTKDSAAGWREK
ALYYMIDICLNPDNEIIIDENSVENPETTKIIYLVSELWKKLVNSKNLPNITSIYSENFQSTDRFLLAQ
NFIRMHTTDKSAIQAALDEFNRMAFNADRSQVTNVGAVFGVARGHVLLKQVQKAKTVLKMVNG
RVWNFDDSDYLEKCWLMLADIYINQNKNDQAVTFLDLVFKYNCNCLKAFELYGYMREKEQKYV
EAYKMYEKAFMATKERNPGFGYKLAFTYLKAKRLFACIETCQKVLDLNPQYPKIKKEIMDKAKA
LIRT (SEQ ID NO: 40)

FIG. 14E

Che-2

Chlamydomonas

>Cr_Che-2 predicted peptide sequence
MRLKVKQSSANVHSELTAAVGWNVWNELFTCSDDQTIHKWNMLGEPEQKVSTLDAYFTDMHW
YPVSSKKTQAGGTDVFAVACTDGSVKILSRTGRVEKSIEGHKGACISLRWSYDGTALATAGEDGS
VKIWSRNGMLRSTLAQADSPVYSIVWAYDCDQLCYCTGSNVVIKSLSSNAKQNAWKAHDGVVL
KVDWSPINHLIITGGEDCKYKVWDSFGRLLFQSGLFDYPVTSVAWAPSGELFAVGGFNTLQLCDR
MGWAYSKIHLNDTGSIMTLSWTADSTQLAGGGGSGGVVFGQVVDLALEDGKMQVTVVDDMRIV
VNDILNENADELPEFRDRVIKVSLGYGYLIVATATQCHVYNTTNLGTPHIFDLKDTVTLLLQAERH
FLLLDNSAGIQIYTYEGRQICNPRFQGLRTELLNAQMITLSNDTIAVLDQQASGTTVRFFDTAQGRP
VGEPWQHTLEVKEIALSQAGTINDRQLIVIDRNRDLYLLPVMKRHVAKLAAMCDSARWHDSTAM
LSAMVDQRLCVWYYPSEVYVDKDLLAKTRYTKSDSDFGKSAQIQLFAGNRCLVRRSDGVLVSAA
TSPYPAVLYDMIRKQQWDKATRLCRFIKDPTMWATLAAMAMAAKELNTAEVAFAAIDEVDKTH
FVRKVKQIPTEEGRNAELAVYRRKPEEGESILLQAGLVFRAIKLNIKLFNWERALXLATQHKQHQD
TVLWYRQQFLKNAKLAESITRFMQMNESVVVDQAAVKKKIEEERIKESQRPGAKRYV

(SEQ ID NO: 22)

FIG. 15A

>Cr_Che-2 cDNA sequence

ATGCGTCTCAAGGTCAAGCAGTCCAGCGCGAATGTGCACAGCGAATTAACAGCAGCTGTGGG
CTGGAATGTCTGGAATGAACTGTTCACTTGTAGCGACGACCAGACTATTCACAAATGGAACAT
GCTGGGGGAGCCAGAGCAGAAGGTCAGCACTCTGGACGCATACTTCACGGATATGCACTGGT
ACCCCGTGAGCTCGAAGAAGACGCAAGCAGGCGGGACGGACGTATTCGCGGTGGCGTGCACA
GACGGCTCTGTAAAAATCCTCAGCCGCACGGGCCGCGTGGAGAAGTCCATTGAGGGGCACAA
GGGCGCGTGCATCTCGCTGCGCTGGAGCTATGACGGGACGGCACTGGCGACGGCGGGCGAGG
ACGGGTCGGTAAAGATCTGGTCGCGCAACGGCATGCTGCGCTCCACGCTAGCGCAGGCGGAC
AGCCCCGTGTACTCGATTGTGTGGGCCTACGACTGCGACCAGCTGTGCTACTGCACCGGCTCC
AACGTGGTCATCAAGTCGCTGTCCTCCAACGCCAAGCAGAACGCGTGGAAGGCGCACGACGG
CGTGGTGCTCAAGGTGGACTGGAGCCCCATCAACCACCTCATCATCACAGGCGGCGAGGACT
GCAAGTACAAGGTGTGGGACAGCTTTGGGCGGCTGCTGTTCCAGAGCGGGCTGTTCGACTACC
CGGTCACGTCGGTGGCGTGGGCGCCCAGCGGCGAGCTGTTCGCGGTGGGCGGCTTCAACACG
CTGCAGCTGTGTGACCGCATGGGCTGGGCCTACTCCAAGATCCACCTCAACGACACGGGCAGC
ATCATGACTCTGAGCTGGACGGCGGACAGCACGCAGCTGGCGGGCGGCGGCGGCAGCGGCGG
CGTGGTGTTCGGCCAGGTGGTGGACCTGGCGCTGGAGGACGGCAAGATGCAGGTGACGGTGG
TGGACGACATGCGCATTGTGGTGAACGACATCTTGAACGAGAACGCGGACGAGCTGCCCGAG
TTCCGTGACCGCGTCATCAAGGTGTCGCTAGGGTACGGCTACCTGATCGTGGCCACCGCGACG
CAGTGCCACGTGTACAACACCACCAACCTGGGCACGCCGCACATCTTTGACCTCAAAGACACG
GTCACCCTGCTGCTGCAGGCTGAGCGGCACTTCCTGCTGCTGGACAACTCGGCGGGCATCCAG
ATCTACACCTACGAGGGCCGCCAGATCTGCAACCCGCGCTTCCAGGGCCTGCGCACCGAGCTG
CTGAACGCGCAGATGATCACGCTGTCCAACGACACGATAGCGGTGCTGGACCAGCAGGCCAG
CGGCACCACCGTGCGCTTCTTCGACACGGCGCAGGGCCGGCCAGTGGGCGAGCCGTGGCAGC
ACACGTTGGAGGTGAAGGAGATCGCGCTGAGCCAGGCCGGCACCATCAACGACCGCCAGCTC
ATCGTCATCGACCGCAACCGCGACCTGTACCTGCTGCCCGTCATGAAGCGCCACGTGGCCAAG
CTGGCGGCCATGTGCGACTCGGCGCGCTGGCACGACAGCACCGCCATGCTGTCCGCCATGGTG
GACCAGCGCCTGTGTGTGTGGTACTACCCCAGCGAGGTGTACGTGGACAAGGACCTGCTGGCC
AAGACGCGCTACACCAAGTCCGACTCGGACTTTGGCAAGTCGGCCCAGATCCAGCTCTTCGCC
GGCAACCGCTGCCTGGTGCGCCGCTCCGACGGCGTGCTGGTCTCCGCCGCCACCTCGCCCTAC
CCTGCCGTACTGTACGACATGATCCGCAAGCAGCAGTGGGACAAGGCCACGCGGCTGTGTCG
CTTCATCAAGGACCCCACCATGTGGGCCACGCTGGCGGCGATGGCCATGGCGGCTAAGGAGC
TGAACACGGCGGAGGTGGCGTTCGCGGCGATTGACGAGGTGGACAAAACGCACTTTGTGCGC
AAGGTGAAGCAGATCCCCACGGAGGAGGGCCGCAACGCCGAGCTGGCGGTGTACCGGCGCA
AGCCCGAGGAGGGCGAGTCCATACTGCTGCAGGCCGGCCTGGTCTTCCGCGCCATCAAGCTG
AACATCAAGCTGTTCAACTGGGAGCGCGCGCTGSACCTGGCCACGCAGCACAAGCAGCACCA
GGACACGGTGCTGTGGTACCGCCAGCAGTTCCTCAAGAACGCCAAGCTCGCCGAGTCCATCAC
GCGCTTCATGCAGATGAACGAGTCGGTGGTTGTGGACCAGGCGGCGGTGAAGAAGAAGATCG
AGGAGGAGCGCATCAAGGAGTCGCAGCGGCCAGGCGCCAAGCGCTACGTGTAA

(SEQ ID NO: 21)

FIG. 15B

Human

>Hs_Che-2 gi|7243129|dbj|BAA92612.1| KIAA1374 protein [Homo sapiens]
IELVSCVGWTTAEELYSCSDDHQIVKWNLLTSETTQIVKLPDDIYPIDFHWFPKSLGVKKQTQAESF
VLTSSDGKFHLISKLGRVEKSVEAHCGAVLAGRWNYEGTALVTVGEDGQIKIWSKTGMLRSTLA
QQGTPVYSVAWGPDSEKVLYTAGKQLIIKPLQPNAKVLQWKAHDGIILKVDWNSVNDLILSAGED
CKYKVWDSYGRPLYNSQPHEHPITSVAWAPDGELFAVGSFHTLRLCDKTGWSYALEKPNTGSIFN
IAWSIDGTQIAGACGNGHVVFAHVVEQHWEWKNFQVTLTKRRAMQVRNVLNDAVDLLEFRDRV
IKASLNYAHLVVSTSLQCYVFSTKNWNTPIIFDLKEGTVSLILQAERHFLLVDGSSIYLYSYEGRFIS
SPKFPGMRTDILNAQTVSLSNDTIAIRDKADEKIIFLFEASTGKPLGDGKFLSHKNEILEIALDQKGL
TNDRKIAFIDKNRDLCITSVKRFGKEEQIIKLGTMVHTLAWNDTCNILCGLQDTRFIVWYYPNTVY
VDRDILPKTLYERDASEFSKNPHIVSFVGNQVTIRRADGSLVHISITPYPAILHEYVSSSKWEDAVRL
CRFVKEQTMWACLAAMAVANRDMTTAEIAYAAIGEIDKVQYINSIKNLPSKESKMAHILLFSGNI
QEAEIVLLQAGLVYQAIQININLYNWERALELAVKYKTHVDTVLAYRQKFLETFGKQETNKRYLH
YAEGLQIDWEKIKAKIEMEITKEREQSSSSQSSKSIGLKP (SEQ ID NO: 41)

FIG. 15C

Caenorhabiditis elegans

>Ce_Che-2 gi|4468141|emb|CAB38019.1| CHE-2 protein [Caenorhabditis elegans]
MKLKLSASRKTRHTEMVCGVGWIGTEAILSAADDHVFLLTNTATNESQQILNMPETFFPTSLHIFP
RSQTKGGQNDVFAVSTSDGKINILSRNGKVENMVDAHNGAALCARWNSDGTGLLSSGEDGFVK
MWSRSGMLRSVLAQFATAVYCVAWDSTSSNVLYCNADHCYIKSLKMQVAPIKWKAHDGIILCCD
WNPTSDLIVTGGEDLKFKVWDGFGQILFNSSVHDYPITSISWNTDGTLFAVGSHNILRLCDKSGWS
HSLEKMNAGSVMALSWSPDGTQLAVGTAAGLVFHAHIIDKRLTYEEFEIVQTQKTVIEVRDVSSE
VSRETLETKERISKIAILYKYLIVVTSSHIYIYSSKNWNTPTMIEYNERTVNIIVQCEKIFLVSDGMTIT
IFTYEGRKLINLNPPGQVMALLDERKIDLANDTLVVRDRADNKVLHFFDPTTGKAQGDGNLKHEH
DIVELTVNQCGPLNDRNVAFRDQIGAVHIAMVKTFGVSQRMVKIGSLVEQLVFNDVTNMLCGISE
GKIAVWPLPNVAFHDRNLLQKSLIQKNIGSVGKFPQLANFAGNTIVIRKSDGCLLPTGILPFYGTLIT
MASQSKWDQAIRLCRSIGNDTMWATFAGLAVLHKNMIVMEIAYAALEDDEKVSLINEIKDKTDK
ETRQAMQVVLTGKLADADVLLERSGLSFRSLMLNIQMFKWKRALELGLKNKQWLEIVMGYREK
YLKNCGQKETDPLFLKHMSEVEIDWVHIRELIAAEKAKGNN (SEQ ID NO: 42)

FIG. 15D